May 19, 2015

William Miller
Senior Project Manager, Arizona Branch, U.S. Army Corps of Engineers

Sallie Diebolt
Chief, Arizona Branch, U.S. Army Corps of Engineers

Col. Kimberly Colloton
Los Angeles District Commander, U.S. Army Corps of Engineers

Re: Villages at Vigneto Proposed Development and Whetstone Ranch 404permit

TUCSON AUDUBON SOCIETY

Leaders in conservation and education since 1949

Main Office
300 E. University Blvd., #120
Tucson AZ 85705
TEL 520.629.0510
FAX 520.623.3476

Tucson Audubon's Mason Center
3835 W Hardy Road
Tucson AZ 85742

Karen Fogas
Executive Director
TEL 520.209.1801

kfogas@tucsonaudubon.org

Dear Mr. Miller, Ms. Diebolt and Col. Colloton:

Established in 1 949, the Tucson Audubon Society (Tucson Audubon) is a 501(c)(3) non-profit conservation organization. We are the third largest local Audubon chapter in the nation and write to you on behalf of our membership of approximately 4,000 citizens. Tucson Audubon promotes the protection and stewardship of southeast Arizona's biological diversity through the study and enjoyment of birds and the places they live. Tucson Audubon advocates statewide for the sustainability, resilience, preservation, restoration and conn ectivity of habitats utilized by birds and other wildlife, with special emphasis on riparian habitats and their associated uplands.

The Villages at Vigneto ("Vigneto") is a large, Tuscany -inspired development proposed by El Dorado Benson, LLC ("El Dorado") on more than 12,000 acres of private land. Vigneto would include 27,760 new homes, commercial developments, golf courses and parks, vineyards and orchards, resorts, and an extensive road and utility network. Vigneto would potentially attract up to 70,000 new residents. This population explosion would dramatically impact the quality of life in the town of Benson, which currently has on ly 5,100 residents. The Benson City Council is poised to vote on the final development plan in very short order, perhaps weeks, which would pave the way for construction to begin.

We are writing to formally request that the Army Corps of Engineers (ACE) re - evaluate the Clean Water Act (CWA) Section 404 permit for Whetstone Ran ch issued to Whetstone Partners LLC/LLP (Permit #2003-00826-SDM). We have reviewed this permit and are concerned that the analysis in the permit was incomplete at the time and is now completely outdated due to changed circumstances and new information that has become available since the permit was issued in 2006.

Furthermore, we are concerned that objections and instructions from the Environmental Protection Agency (EPA) seem to have not been resolved prior to the issuance of the 2006 permit, nor did consultation occur with the United States Fish & Wildlife Se rvice (FWS) to evaluate impacts to Endangered Species Act (ESA)-listed species and migratory birds.

It is important to note that Vigneto is a new and different development proposal from Whetstone Ranch. For example, Whetstone Ranch proposed to build up to 20,000 new housing units on 8,200 acres, while Vigneto proposes to build 27,760 housing units on 12,324 acres. Additional acreage proposed for development located west of State Route 90 and adjacent to the Whetstone Mountains were not evaluated by the 2006 404 permit for Whetstone Ranch. Impacts to, and the amount of discharge into, jurisdictional waters from this new development will be significantly different than what was permitted in 2006 and therefore represent significant changed circumstances that sh ould trigger a re-evaluation of the permit and/or re-initiation of a new permitting process. This evaluation should fully consider important new information that has become available since the permit was issued in 2006 , and the ACE should require that a new National Environmental Policy Act (NEPA) analysis and public process be conducted.

404 Permit for Whetstone Ranch

Permit # 2003-00826-SDM, issued by the ACE Los Angeles District on June 21, 2006, provides the following project description and location:

"Project Description: To discharge dredged and/or fill material into 51 acres of waters of the United States to develop the approximately 8,200-acre Whetstone Ranch as a master-planned community that includes residential and commercial land uses, and associated stormwater management facilities, roadways, utilities, and recreational amenities, as shown on the attached drawings. Project Location: In unnamed washes at (Sections 31, 32, and 33, TI7S, R20E, and Sections 3, 4, 5, 6, 7, 8, 9, 10, 15, 16, 17, 18, T18S, R20E), Benson, Cochise County, Arizona."

ACE Regulations Governing Re-evaluation of Section 404 permits

ACE's regulations governing the re-evaluation of Section 404 permits state the following:

> The district engineer may re-evaluate the circumstances and conditions of any permit, including regional permits, either on his own motion, at the request of the permittee, or a third party, or as the result of periodic progress inspections, and initiate action to modify, suspend, or revoke a permit as may be made necessary by considerations of the public interest. … Among the factors

> to be considered are the extent of the permittee's compliance with the terms and conditions of the permit; whether or not circumstances relating to the authorized activity have changed since the permit was issued or extended, and the continuing adequacy of or need for the permit conditions; any significant objections to the authorized activity which were not earlier considered; revisions to applicable statutory and/or regulatory authorities; and the extent to which modification, suspension, or other action would adversely affect plans, investments and actions the permittee has reasonably made or taken in reliance on the permit." 33 C.F.R. 325.7(a) (emphasis added).

As a third party requesting the ACE to re-evaluate the circumstances and conditions of the Whetstone Ranch 404 permit, Tucson Audubon would like to bring to the attention of the ACE the nature and magnitude of the changed circumstances. As we detail below, it is clear that "circumstances relating to the authorized activity have changed since the permit was issued or extended" between the Whetstone Ranch proposal and the new Vigneto proposal. The circumstances under which the ACE is compelled to re-evaluate its decision are as follows:

> Re-evaluation of Permit Decision. This office may re-evaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a re-evaluation include, but are not limited to, the following:
>
> a. You fail to comply with the terms and conditions of this permit.
>
> b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate….
>
> c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.
>
> Such a re-evaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5.

Terms and Conditions of Permit #2003-00826-SDM

During ACE's re-evaluation of the Section 404 permit issued by ACE to Whetstone Partners LLC/LLP in 2006 (Permit #2003-00826-SDM), we encourage ACE to assess if the terms and conditions of the permit have been met, including required reporting, monitoring and mitigation maintenance. In addition, in accordance with regulations, the ACE should consider incomplete information and significant new information that has surfaced that could not have been adequately considered at the time of the original public interest decision.

For example, special condition (d) states:

"Each year that this permit is valid, beginning one year from the date of this permit, the permittee shall submit to the Corps an updated exhibit for comparison and compliance purposes, showing current Drainage Corridor Impact Areas, Temporary Utility Grading Impact Areas, Roadway Grading Impact Areas, and Pad Grading Impact Areas."

Did Whetstone Ranch submit these yearly reports and exhibits? Has El Dorado Benson LLC complied with these reporting requirements since assuming ownership?

Did Whetstone Partners LLC/LLP comply with all of the mitigation conditions identified in Permit #2003-00826-SDM and Exhibit C: Habitat Mitigation and Monitoring Plan, ACOE File No. 2003-00826-SDM Whetstone Ranch, prepared for Whetstone Partners LLC/LLP by Westland Resources, Inc. (November, 2005)? Has El Dorado Benson LLC complied with these mitigation conditions since assuming ownership?

Per Special Condition (g), ACE must review permit compliance 10 years after the permit was issued, which would be in June, 2016:

> Permit Compliance Review. The Corps shall review compliance with this permit 10 years from date of permit issuance to ensure that the implementing permit conditions are being adequately implemented and are effectively mitigating environmental impacts as projected in this EA. As part of this review, the permittee shall submit a report detailing permit compliance to the Corps 5 years and 10 years from date of permit issuance.

Did Whetstone Partners LLC/LLP submit to ACE the 5-year report detailing permit compliance, which was due in June, 2011? Has El Dorado Benson LLC notified the ACE of changes to the original plan and requested an updated compliance review assessment?

Given that El Dorado Benson LLC is attempting to finalize approval and gain Benson City Council approval for its Final Community Master Plan this year for its significantly expanded development proposal (Villages at Vigneto), the ACE should consider initiating an early and expedited review of permit compliance and changed circumstances, or El Dorado Benson LLC may attempt to break ground on the development prior to the 10 year permit review.

Special condition (g) also states that nothing in this condition alters the ACE ability to suspend, revoke, or modify the permit under the ACE regulations.

Significant New Information Not Previously Considered and Changed Circumstances Between Whetstone Ranch and Villages at Vigneto

Size, Configuration and Discharge into Waters of the U.S.

The Villages at Vigneto is a new and a different development proposal than Whetstone Ranch. Whetstone Ranch proposed to build up to 20,000 new housing units on 8,200 acres, while Vigneto proposes to build 27,760 housing units on 12,324 acres. Vigneto proposes to develop land not identified or included in the Whetstone Ranch permit project location cited above. Therefore, impacts to jurisdictional waters from this new proposal will be significantly different and should be evaluated. The CWA Section 404 permit issued to Whetstone Partners LLC/LLP in 2006 (Permit #2003-00826-SDM), which was later transferred to El Dorado Benson LLC in December of 2014, must be re-evaluated for compliance and re-opened to consider changed circumstances and new scientific information that has become available in the past decade.

When assessing the previously proposed Whetstone Ranch proposal Levick *et al*. 2006, in "*Simulated Changes in Runoff and Sediment in Developing Areas near Benson, Arizona*", state:

> The standard process for CWA permitting associated with new development rarely considers the special attributes and circumstances encountered in these environments… In this study AGWA was applied to an 8,200-acre study area proposed for development located near Benson, Arizona…The largest average changes in runoff volume (~ +413%) and sediment yield (~ +231%) across the five watersheds occurred for the two-year, one-hour design storm… Results definitively indicate that the proposed land-use changes will result in significant alteration of the hydrologic regime both within and downstream of the impacted watersheds where they empty into the San Pedro River… a larger-scale analysis of development within the San Pedro River Basin would be necessary to ascertain cumulative impacts to the river and identify areas of critical concern… Changes [to the hydrologic regime] include the impairment of water resources due to increases in stormwater runoff and sediment yield during frequent, small storm events. This study reveals change as a result of individual discharge and through the cumulative effect of numerous changes to the environment in multiple adjacent watersheds. … net runoff and sediment yield increased at the watershed outlets due to urbanization and more impermeable surfaces… Recent studies on the interactions between ecological and hydrological processes have indicated that increased surface

runoff and/or sediment yield can result in harmful impacts to the aquatic ecosystem (Wilcox and Newman, 2005). These impacts may include more frequent and severe flooding, stream channel adjustment, stream bank erosion, water quality degradation from sedimentation and contaminant transport, habitat destruction and decreased biological diversity (Dorworth and McCormick, 2005)… For the purpose of this study, negative impacts are considered to be any increase in surface runoff and sediment yield (Kepner et. al., 2004). **The hydrologic modeling results indicate that significant increases in both runoff and sediment yield are likely at the San Pedro River main-stem under the development scenario**… **The proposed development will profoundly alter the hydrology for five watersheds with a total area of 86 square kilometers (33.2 square miles). Those watersheds all flow directly into the San Pedro River within a few miles downstream (north) of the San Pedro Riparian National Conservation Area, and will have a significant impact on the hydraulic and sediment regimes in this river reach**… The net result is that more frequent and larger runoff events can be expected from the project area, which has also been commonly associated with channel incision and increased sediment yield downstream (emphasis added).

The Preliminary Community Master Plan for the Villages at Vigneto (March, 2015) states the following permitted uses in proposed commercial and mixed use areas: retail sales, bars and restaurants, resort/hotel, banks and financial institutions, day care facilities, business or professional offices, pharmacy with drive-through, grocery stores, barber or beauty salon, dry cleaner, furniture and appliance repair, health club, entertainment establishments including electronic game centers, arcades, ice rink, pool halls, performing art centers and theaters, automobile service stations, convenience stores, car wash (hand or automatic), mini-storage facilities, and other uses as reviewed and approved by the City of Benson Planning Commission and City Council at a future time (Villages at Vigneto Preliminary Community Master Plan, March 2015, pages 18 -19).

As noted above, the Vigneto proposes to develop on 12,324 acres of land, **a 50% increase over the original Whetstone Ranch proposal.** There are drainages that qualify as jurisdictional waters on this additional 4,124 acres of land, most of which are located west of State Route 90 at the base of the Whetstone Mountains, adjacent to both the Coronado National Forest and Kartchner Caverns State Park. With this dramatic 50% increase between the Whetstone Ranch and Vigneto developments, there may be a proportional increase in acres

of jurisdictional waters impacted, as well as a significant increase in the overall discharge into jurisdictional waters. Therefore, the ACE should re-evaluate the permit, or better yet, initiate a new permitting process with public comment, to conduct an analysis to quantify impacts and identify avoidance and minimization measures for these additional impacted jurisdictional waters.

Drought Emergency

Significant new information has become available since the issuance of the Whetstone Ranch 404 permit regarding the current and continuing drought, as well as predicted future megadroughts driven by human-caused climate change.

Arizona is now in year 16 of a state declared drought emergency (PCA 99006). In addition, the latest climate change models predict a high probability for megadroughts (multi-decadal droughts with increased temperatures) to occur in this region in the coming decades. Water is our most valuable resource in the desert, especially during times of drought. Approving this large use of limited water resources without sufficient analysis could greatly jeopardize the future availability of water to communities along the San Pedro River, including Benson itself.

Climate Change and Megadroughts

NASA and NOAA confirm that globally, and specifically in Arizona, 2014 was the hottest year in the modern record. Increased temperatures result in increased evaporation, and thus greater soil desiccation, which in turn may result in the loss of riparian vegetation and/or contribute to undesirable vegetation type conversions, exotic species invasions and devastating wildfires. [1,2]

In February 2012, University of Arizona's Institute of the Environment climate expert Gregg Garfin, Deputy Director for Science Translation and Outreach, Assistant Specialist, and Assistant Professor of Climate, Natural Resources and Policy in the School of Natural Resources and the Environment, said the following signs of climate change in the region

[1] See online at: http://www.nasa.gov/press/2015/january/nasa-determines-2014-warmest-year-in-modern-record/#.VO9vVfnF-So [2] See online at: http://environment.arizona.edu/news/tucson-climate-plan

already are prevalent in the Southwest: rising temperatures, earlier snowmelt, record-setting drought, plummeting Colorado River reservoir storage, widespread vegetation mortality, and more large wildfires.(Garfin *et al.* 2014).

Columbia University's Lamont-Doherty Earth Observatory Palisades Geophysical Institute - Lamont Research Professor Richard Seager projects a transition to a sustained drier climate beginning in the late 20th and early 21st centuries in the southwestern United States (U.S.) and parts of northern Mexico. Climatologist Seager explains the projected severe drying that is imminent or already under way is unlike any climate state we have seen in the instrumental record. Climate research has shown that in Medieval times the American Southwest experienced multidecadal droughts. Seager *et al.'s* climate change models show a high probability for even more severe droughts to occur in the Southwest in the coming decades. Seager suggests future droughts will continue to occur during persistent La Niña events, but will be worse than any since the Medieval period because the La Niña conditions will be perturbing a base state that is drier than any state experienced recently (Seager *et al.*, Science, 25 May 2007, Vol. 316, pages 1181-1184).

A study published in the American Meteorological Society's Journal of Climate predicts that southeast Arizona has a 30-50% chance of experiencing a devastating "megadrought" in the coming century. According to the study by Cornell University, the University of Arizona and the United States Geological Survey (USGS), southeast Arizona is among the regions of the Southwest that have the highest level of megadrought risk. Megadroughts can last more than 35 years and can bring extreme temperatures that further desiccate already parched landscapes. On June 23, 1999, the Arizona Division of Emergency Management declared a statewide drought emergency (PCA99006) which remains in effect as a "current open disaster" over 16 years later.

Echoing Seager *et al.*, a new study, "*Unprecedented 21st-Century Drought Risk in the American Southwest and Central Plains*," states that future droughts could far exceed those of the Medieval period. The current drought directly affects more than 64 million people in the Southwest and Southern Plains, according to NASA, and many more are indirectly affected because of the impacts on agricultural regions. "Even when selecting for the worst megadrought-dominated period, the 21st century projections make the megadroughts seem like quaint walks through the Garden of Eden." said Jason E. Smerdon, a co-author and climate

scientist at the Lamont-Doherty Earth Observatory, part of the Earth Institute at Columbia University.

"The surprising thing to us was really how consistent the response was over these regions, nearly regardless of what model we used or what soil moisture metric we looked at," said lead author Benjamin I. Cook of the NASA Goddard Institute for Space Studies and the Lamont-Doherty Earth Observatory. "It all showed this really, really significant drying."[3]

Riparian forests are reliant upon the availability of sufficient surface and subsurface water, which will invariably be strained by increasingly hot and dry conditions associated with prolonged droughts and climate change predicted for the desert Southwest. Impacts from increased groundwater pumping may exacerbate climate-driven drying and further threaten the ecological integrity of the drought-strained San Pedro River watershed.

The USGS news release summarizing the findings of its Part 2 Study of the Middle San Pedro River Watershed states:

> Climate has also greatly influenced the amount of water available throughout the San Pedro watershed over the past few decades. The study found that groundwater and streamflow responded to periods of higher precipitation in the mid-1980s to mid-1990s, as well as to periods of overall lower precipitation in the 1960s through mid-1980s and mid-1990s to 2009. The median annual streamflow of the San Pedro River near Tombstone decreased by 50 percent between the periods of 1968–1986 and 1997–2009. The amount of water entering the soil from the San Pedro River, also known as streamflow infiltration, has also decreased 44 percent from 1914–2009.

Groundwater Pumping

The amount of water Vigneto would pump from the deep aquifer is estimated to be approximately 10,000+ acre-feet of water per year. By comparison, in 2013 the City of Benson pumped only 833 acre-feet of water. The combined impacts of dramatically increased ground water pumping, ongoing drought, and predicted climate change-induced megadroughts upon surface water flows of the San Pedro River and associated wildlife habitats should be considered carefully by the ACE, EPA, FWS and the Benson City Council.

While we recognize that ACE does not regulate groundwater use, the possibility that groundwater pumping may negatively impact an Aquatic Resource of National Importance and

[3] Benjamin I. Cook, Toby R. Ault, Jason E. Smerdon. Unprecedented 21st century drought risk in the American Southwest and Central Plains. Science Advances, 12 February 2015 DOI: 10.1126/sciadv.1400082

designated critical habitats for multiple threatened and endangered species is highly significant, and within the regulatory responsibilities of the ACE. The amount of groundwater pumping by Vigneto will be significantly greater than was projected for Whetstone Ranch. Vigneto proposes to build 7,760 more homes than did Whetstone Ranch. This would equate to significantly greater residential water use, and thus greater groundwater pumping. In addition, Vigneto proposes additional mixed use commercial developments, resorts, and vineyards that Whetstone Ranch did not propose. These newly conceived developments will require additional groundwater pumping the impacts of which will be exacerbated by drought.

Groundwater Pumping and its Legal Nexus to Federal Reserved Water Rights:

The Tribute Development and Associated Case Law

When the San Pedro Riparian National Conservation Area (SPRNCA) was established by Congress in 1988, it came with federal reserved water rights. However, the exact quantities of those rights have not yet been adjudicated in court. Although Arizona state law does not yet recognize the connection between groundwater and surface water flow, federal law does recognize this connection. We therefore submit that groundwater pumping, such as is proposed by Vigneto, has the ability to infringe upon federal reserved water rights of the nearby SPRNCA (in particular St. David Cienega) and potentially other water rights further downstream on the San Pedro River.

The October 14, 2014 ruling on the "Tribute Case" (LC2013-000264-001 DT, Docket Code 049) has clarified the physical and legal relationship between groundwater pumping and federal reserved water rights, although the current standing ruling from the Arizona Superior Court on this legal case is under appeal. The standing ruling, handed down by the Honorable Crane McClennen of the Arizona Superior Court in Maricopa County, both affirms the Bureau of Land Management (BLM)'s federally reserved water rights associated with the SPRNCA and finds that the Arizona Department of Water Resources (ADWR) failed to meet its duty to ensure the proposed water source for the Tribute development (to be served by Pueblo del Sol Water Company, or PDS) will be legally available for at least 100 years. The ruling states:

> 10. Accordingly, by relying on A.A.C. R12-15-718 to find that the groundwater re-quested by PDS is legally available for at least 100 years based on the CC&N issued to PDS in 1972 and without taking into account BLM's FRWR in SPRNCA and the state-law instream flow water right possessed by the BLM on the availability of such supplies, ADWR failed to meet its mandatory

duty under A.R.S. § 45-108 to ensure that the proposed source of water will, among other things, be legally available for at least 100 years.

11. The Court concludes that ADWR abused its discretion when it determined that PDS had a legally available water supply for at least 100 years based on the fact that PDS possesses a CC&N issued by the ACC and, therefore, ADWR's decision should be set aside. On remand, in determining whether the amount of water requested by PDS is legally available, ADWR must consider the existing legal claims and/or rights and determine whether and to what extent these claims and/or rights may affect the availability of the water supplies requested in PDS's application.

The Court therefore orders that ADWR's decision is VACATED and the matter is REMANDED to ADWR for further Proceedings in accordance with this judgment.

The ACE should consider whether this case law has bearing on the Vigneto development. The large amount of groundwater pumping Vigneto will require will create a cone of depression that may similarly infringe upon the federal reserved water rights of the SPRNCA. If there is currently insufficient data to reach such a determination, ACE should insist that further research be conducted to clarify this potential relationship, as has been proposed, in part, by Part 3 of the Middle San Pedro Watershed Study. The ACE should require that Part 3 of the USGS study be completed, to better inform both the 404 permitting process and NEPA analysis.

Southwestern Riparian Habitat: A Biologically Diverse and Threatened Ecosystem

The American Bird Conservancy's report on the "*Top Twenty Most Threatened Bird Habitats in the United States*" lists Southwestern Riparian Habitat as the fifth most threatened in the nation. This increasingly rare habitat type, epitomized by the Lower San Pedro River watershed, is described as occupying only a tiny fraction of the land area while supporting the largest concentrations of animal and plant life, and the majority of species diversity in the desert southwest, a designated "hotspot" of biological diversity. The report states "The scarcity of water in the Southwest makes rivers and streams particularly important for sustaining the region's communities. This dependence places a severe strain on natural ecosystems. Achieving riparian habitat conservation depends on public agency buy-in to broad-scale land management plans and the successful provision of incentives to private property owners to restore their degraded land. Riparian areas take time to recover… Currently, though, efforts to restore riparian areas are being considerably outpaced by the rate at which they are being lost, making

these vibrant ecosystems an ever-rarer feature of the Southwest." http://www.abcbirds.org/newsandreports/habitatreport.pdf.

The Arizona Partners in Flight (AzPIF) "*Bird Conservation Plan"* states, "Riparian woodlands comprise a very limited geographical area that is entirely disproportionate to their landscape importance, recreational value, and immense biological interest (Lowe and Brown 1973). It has been estimated that only 1% of the western United States historically constituted this habitat type, and that 95% of the historic total has been altered or destroyed in the past 100 years (Krueper 1993, 1996)… Riparian woodlands are among the most severely threatened habitats within Arizona . . . Maintenance of existing patches of this habitat, and restoration of mature riparian deciduous forests should be among the top conservation priorities in the state". http://www.azgfd.gov/pdfs/w_c/partners_flight/APIF%20Conservation%20Plan.1999.Final.pdf

Riparian woodlands in the desert southwest are an extremely important resource because they constitute <1% of the desert landscape, yet typically support >50% of the breeding birds. Indeed, the positive effects of even a degraded riparian area in central Arizona extend up to 1 km into the adjacent uplands (Szaro and Jakle 1985). Riparian woodlands also provide shelter and critical food resources for dozens of species of migratory birds that stop in these woodlands during their spring and fall migrations. From 2006 – 2008, Kirkpatrick *et al.* found that riparian areas contained 68% more species and 75% more individual birds compared to adjacent uplands, with this pattern holding true for both the breeding and non-breeding bird communities. They state:

> First, should long-term drought conditions persist and/or ground water levels fall to the point where surface water flows are reduced or eliminated, populations of breeding (e.g., Black Phoebe, Common Yellowthroat, Yellow Warbler, Song Sparrow, and Lesser Goldfinch) and migrant (e.g., Yellow-rumped Warbler and Wilson's Warbler) species are likely to decline. Second, should long-term drought conditions persist and/or ground water levels fall to the point that riparian vegetation is negatively affected, populations of breeding species such as Bell's Vireos, Yellow Warblers, and others are likely to decline… Three species that inhabit low-elevation riparian woodland are considered Arizona PIF priority species: Southwestern Willow Flycatcher (*Empidonax traillii extremus*), Western Yellow-billed Cuckoo (*Coccyzus americanus occidentalis*), and Lucy's Warbler (*Vermivora luciae*). An additional 8 species that inhabit low-elevation riparian woodland are considered Arizona PIF preliminary priority species: Brown-crested Flycatcher (*Myiarchus tyrannulus*), Northern Beardless-tyrannulet (*Camptostoma imberbe*), Bell's Vireo (*Vireo bellii*), Yellow Warbler (*Dendroica petechia*), Rufous-winged Sparrow (*Aimophila carpalis*), Abert's Towhee (*Pipilo aberti*), and Summer Tanager (*Piranga rubra*).

Some 80 percent of vertebrate species in the arid southwest region are dependent on riparian areas for at least part of their life cycle; over half of these cannot survive without access to riparian areas (Noss and Peters 1995). Arizona and New Mexico have lost 90 percent of pre-settlement riparian ecosystems (Fig 3e, Noss et al. 1995). The Nature Conservancy (TNC) lists the Fremont cottonwood-Gooding willow riparian community as highly imperiled. In Arizona and New Mexico, more than 100 federally and state listed species are associated with cottonwood-willow bosques (Noss and Peters 1995).

Among U.S. Federal register notices listing plants and animals as endangered species, water impoundment and diversion are among the most frequently cited threats mentioned. Inundating vegetation in reservoirs behind dams and changes in river flow are among the most severe pressures on threatened plants and nesting birds in the US/Mexico borderlands. The regional decline of 36 of the 82 breeding bird species which formerly used riparian woodlands is a case in point. In combination with water diversion, groundwater pumping has affected nearly all river valleys in Arizona's portion of the Sonoran Desert. In the heart of agricultural areas, groundwater overuse has been most precipitous, leading to ground subsidence, salinization and the demise of riparian forests (Nabhan and Holdsworth 1998, page 2).

According to Webb, Leake, & Turner 2007 in "*The Ribbon of Green"*, page 223, "Riparian vegetation has generally increased along the [San Pedro] river north of the U.S.-Mexico border. . . [and] closely follows the alternating pattern of perennial-ephemeral flow that characterizes this watercourse along its greater than 150-mile length in Arizona " Moreover, " . . . the case of riparian vegetation change on the San Pedro River represents one of the largest increases in woody riparian vegetation in the Southwest. Many researchers have noted that this river, once swampy, now sustains a verdant forest."

Ecological Significance of Ephemeral and Intermittent Streams

Levick *et al*. 2008, in "*The Ecological and Hydrological Significance of Ephemeral and Intermittent Streams in the Arid and Semi-arid American Southwest*", address the hydrological and ecological significance of ephemeral and intermittent streams in the arid and semi-arid Southwestern United States for the purpose of illustrating their connection and value to perennial stream systems and other "waters of the United States" as protected under the Federal Water Pollution Control Act, otherwise known as the Clean Water Act (CWA). The CWA was established to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." They describe the importance of intermittent and ephemeral water sources:

> Ephemeral and intermittent streams are the defining characteristic of many watersheds in dry, arid and semi-arid regions, and serve a critical role in the protection and maintenance of water resources, human health, and the environment... Ephemeral and intermittent streams make up approximately 59% of all streams in the United States (excluding Alaska), and over 81% in the arid and semi-arid Southwest (Arizona, New Mexico, Nevada, Utah, Colorado and California) according to the U.S. Geological Survey National Hydrography Database…Ephemeral and intermittent streams provide the same ecological and hydrological functions as perennial streams by moving water, nutrients, and sediment throughout the watershed. When functioning properly, these streams provide landscape hydrologic connections; stream energy dissipation during high-water flows to reduce erosion and improve water quality; surface and subsurface water storage and exchange; ground-water recharge and discharge; sediment transport, storage, and deposition to aid in floodplain maintenance and development; nutrient storage and cycling; wildlife habitat and migration corridors; support for vegetation communities to help stabilize stream banks and provide wildlife services; and water supply and water-quality filtering. They provide a wide array of ecological functions including forage, cover, nesting, and movement corridors for wildlife. Because of the relatively higher moisture content in arid and semi-arid region streams, vegetation and wildlife abundance and diversity in and near them is proportionally higher than in the surrounding uplands. In the rapidly developing southwest, land management decisions must employ a watershed-scale approach that addresses overall watershed function and water quality…Consideration of the cumulative impacts from anthropogenic uses on these streams is critical in watershed-based assessments and land management decisions to maintain overall watershed health and water quality.

Vigneto proposes to directly and indirectly impact numerous intermittent and ephemeral streams, both on and off site. Levick *et al.*'s 2008 findings support the need for a 404 permit re-evaluation and a NEPA analysis that will disclose and quantify Vigneto's direct, indirect, and cumulative impacts.

Designated Conservation Areas and Conservation Investments Potentially Impacted:

Downstream from Vigneto are numerous important conservation areas and riparian mitigation properties located astride the San Pedro River. The sustainability of these vital conservation areas and tourist destinations relies upon sufficient water quantity and quality.

For example, just north of Benson and Pomerene, downstream of the Vigneto proposal, potentially impacted Global Important Bird Area (IBA) parcels include the Salt River Project (SRP) mitigation, TNC managed Three Links Farm, consisting of 2,156 acres that lie along the San Pedro River. Here the banks of the San Pedro are lined by an exceptional Fremont cottonwood-Goodding willow forest and mesquite bosque. The River's forest is host to 345 species of birds including 13 species of breeding raptors, and is a major migratory pathway for Neotropical birds such as Gray Hawk and the rare Western Yellow-billed Cuckoo. It is also the residence for more than 80 species of mammals, 40 species of reptiles and amphibians, 100 species of butterflies and 20 species of bats. Beaver have migrated to the property since the Conservancy's acquisition. Three Links is a retired farm that has had 836.9 acres placed in permanent conservation easements. The easements encompass six linear miles of the San Pedro River (9.75 kilometers) sub-divided into five parcels sold to conservation owners. Agricultural wells have been dismantled and a large proportion of the water rights are in the process of being retired from the property with the goal of increasing in-stream flow in the San Pedro River. As a result, a majority of the former agriculture fields are becoming dominated by mesquite. The river has been fenced from livestock and is a mix of closed canopy cottonwood/willow gallery forest with an open understory of tamarisk and hackberry, ash, Arizona walnut and segments of willow stands. The uplands are Chihuahuan Desert Scrub typified by creosote bush, black brush and yucca.

Much is at stake: it is no wonder the Vigneto development proposal has raised serious concerns from local area residents and scientists. Developers indicate they will access water from the deepest of natural aquifers. However, one of the primary concerns is that this significant projected increase in ground water pumping would contribute to ground water depletion and could ultimately reduce surface water flows in the San Pedro River - putting the region's birds, biodiversity, downstream water users, and economy at risk.

Other conservation and mitigation lands at risk from Vigneto's groundwater pumping include:

- Mitigation property identified for the Whetstone Ranch development itself - 144 acres along the San Pedro River, about 2 miles northeast of the northeastern comer of the Property, within Township 17 South, Range 20 East in the Southeast V4 of Section 23
- San Pedro Riparian National Conservation Area / Global IBA / St. David Cienega
- 7B Ranch, which will be added to SPRNCA in accordance with the Resolution Copper land exchange authorized by the National Defense Authorization Act of 2015

- Four SRP mitigation properties on the lower San Pedro River
- Broken Hill Proprietary Company (BHP) Billiton Mitigation Property, near San Manuel
- Kartchner Caverns State Park's world class wet cave system

The San Pedro River Watershed

The San Pedro River heads in Sonora, Mexico and flows northward for approximately 100 miles to its confluence with the Gila River near the Town of Winkelman, Arizona. It is the last major undammed river in the American Southwest, and exhibits a remarkably intact riparian system including extensive stands of Fremont cottonwood (*Populus fremontii*)/ Goodding's willow (*Salix gooddingii*) gallery forest and large mesquite (*Prosopis velutina*) bosques. Duncan and Slagle 2004 describe the San Pedro River as one of the most significant perennial undammed desert rivers in the United States.

An approximately 40-mile reach of the upper San Pedro River between the International Boundary and St. David is encompassed by the BLM's San Pedro Riparian National Conservation Area (SPRNCA), the first one of only two RNCAs in the nation. The SPRNCA was designated in order to protect the ". . . unique riparian area and the aquatic, wildlife, archeological, paleontological, scientific, cultural, educational, and recreational resources of the public lands surrounding the San Pedro River."

The San Pedro River serves as a migratory corridor for an estimated four million migrating birds yearly between the Sky Islands of the Madrean Archipelago in northern Sonora and southern Arizona in its southernmost reaches and, in the north, Arizona's Central Highlands. The river is not only a major corridor between varied habitat types and ecoregions; it represents a ribbon of water and riparian vegetation in an otherwise arid environment. The river thus exhibits a remarkably high biodiversity, both in resident and migratory species.

Notably, 36 species of raptors, including the Gray Hawk (*Asturina nititda* = *Buteo nitidus*), Mississippi Kite (*Ictinia mississippiensis*), Common Black Hawk (*Buteogallus anthracinus*), and Zone-tailed Hawk (*Buteo albonotatus*) can be found within the San Pedro River watershed. Regarding the Gray Hawk, the SPRNCA is thought to support 40 percent of the nesting Gray Hawks in the United States.

Tucson Audubon established and, in partnership with Audubon Arizona, continues to implement the Arizona component of the global Important Bird Area (IBA) Program, initiated in 1982 by BirdLife International. In special recognition of the SPRNCA's extraordinary avian diversity, it

was designated North America's first Globally Important Bird Area by the American Bird Conservancy, in conjunction with the Audubon Society, in 1996. The lower San Pedro River is also a Global IBA. IBA designation is particularly relevant to protecting critical habitat utilized by birds during some part of their life cycle (breeding, feeding, nesting, and migrating) as well as conserving the general biodiversity of wildlife species. Migration and molt are very taxing on birds, and for some species migration is the time of greatest mortality. Tucson Audubon leads the Avian Science Initiative while maintaining the Arizona IBA Bird Survey Database and website. A Monitoring Avian Productivity and Survivorship (MAPS) bird banding and research site has been established on the SPRNCA.

Led by Dr. William Kepner of the EPA, scientists from New Mexico State University and others have recently modeled the San Pedro River watershed, mapping metrics reflecting ecosystem services and biodiversity features using USGS Gap Analysis Program data, including land cover, land stewardship, and deductive habitat models for terrestrial vertebrate species. The San Pedro River watershed supports significant biodiversity, especially avian, and significantly surpasses even the Middle Rio Grande River in biodiversity. See Figures 1 & 2 below.

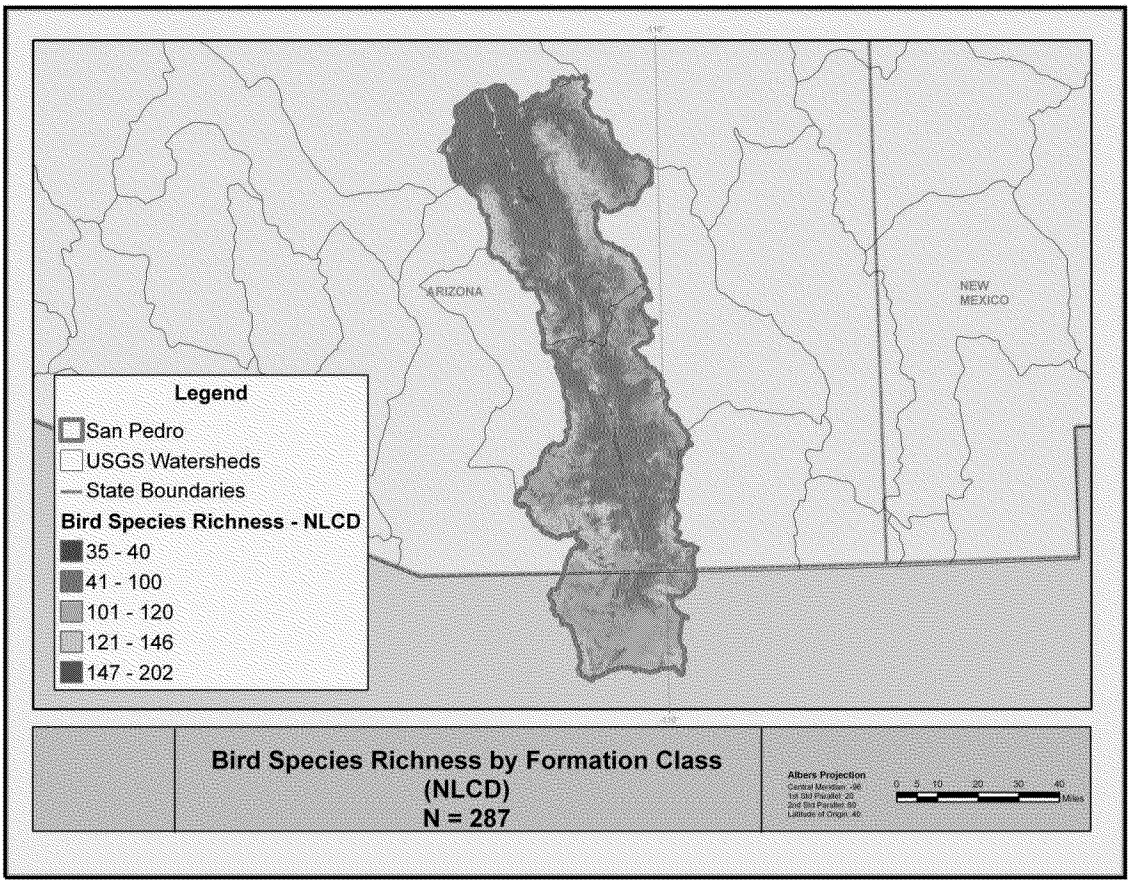


Figure 1: Bird Species Richness by Formation Class, Courtesy of Dr. William Kepner, EPA

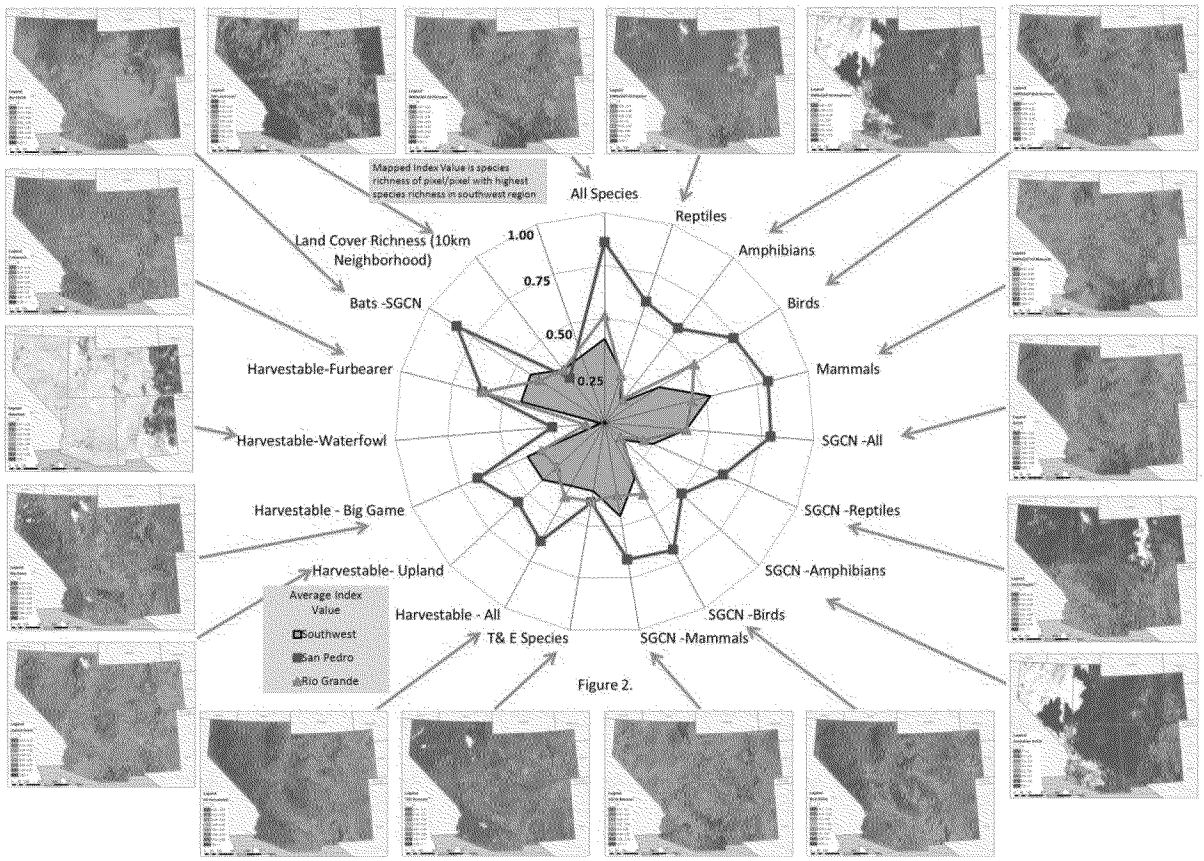


Figure 2: Biodiversity Metrics for the Southwest Region portrayed as a Radar Graph. May 2011 Courtesy of Dr. William Kepner, EPA

Nguyen *et al*. 2014, in "*Long-term decrease in satellite vegetation indices in response to environmental variables in an iconic desert riparian ecosystem: the Upper San Pedro, Arizona, United States*", state that:

> The Upper San Pedro River's riparian forest is threatened by diminishing groundwater and surface water inputs, due to either changes in watershed characteristics such as changes in riparian and upland vegetation, or human activities such as regional groundwater pumping… Many cases of deterioration are due to direct impacts on river systems such as diversion of water for human use, flow regulation and introduction of invasive species (Poff et al., 1997)… Concerns about the health of the riparian forest are partly due to an observed decrease in flows in the river over the past century (Thomas and Pool, 2006). Groundwater contributions to the river base flow (estimated as the lowest 7-day flow period of the year) decreased by 66% from 1942 to 2000 (Miller et al., 2002; Thomas and Pool, 2006), and in 2005, the US Geological Survey stream gauge (09471000) at Charleston in the SPRNCA recorded zero flow over a 7-day period for the first time since it was installed in 1904 (Mac Nish et al., 2009). Similar flow reductions did not

> occur in other southeastern Arizona and southwestern New Mexico rivers over the same period (Thomas and Pool, 2006). …possible causes for flow reductions (include) lowering of groundwater levels near the river through regional pumping to support population growth in the watershed (Serrat-Capdevila et al., 2007; Mac Nish et al., 2009). ,,, Stromberg et al. (2009a) predicted that successional changes will take place on the river, with the bands of cottonwoods and willows narrowing due to lack of overbank flooding. They also predicted that ageing stands of cottonwoods would be replaced by other patch types such as mesquites and grasslands. Our analysis supports these predictions and demonstrates that these processes are already underway. … Depth to water table… increased between 2005 and 2012.… Mean DTW is currently between 2 and 3m, sufficient to sustain cottonwoods and willows (Stromberg et al., 1996; Snyder and Williams, 2000; Williams and Scott, 2009), but if the recent trend of increasing DTW continues, those trees can be expected to eventually decrease in the riparian zone (Stromberg et al., 1996, 2006, 2009a,b). Mac Nish et al. (2009) showed that 50 years of groundwater pumping has created a basin-wide cone of depression of the regional aquifer that they suggested was a key cause of base flow decline in the river. …future research should continue to focus on the relationship between regional pumping, flows in the river and the health of the riparian forest in SPRNCA.

Ecosystem Services and Economics

It is widely understood that the human condition is intrinsically linked to the quality of the environment and the services it provides. Ecosystem services, i.e., "services provided to humans from natural systems," have become a key issue of this century in resource management, conservation, human well-being, and environmental decision analysis.

Metrics for the above illustrated EPA study were derived from species-of-greatest-conservation-need, threatened and endangered species, harvestable species (i.e., upland game, big game), total species richness, and taxon richness. Based on this biometric study, the San Pedro watershed's extraordinary ecosystem services provide tremendous biodiversity at the confluence of four different ecosystems. The entire river is a "keystone" transition zone.

The term “ecological values” refers to clean air, clean and abundant water, fish and wildlife habitat and other values that are generally considered public goods. “Ecosystem services” means the benefits that human communities enjoy at no cost as a result of these natural processes and biological diversity.

Employment and economic opportunities are important in order to maintain our quality of life while providing assurances that development will occur in suitable locations so that ecological

values will be maintained and improved. If, after carefully avoiding the most sensitive resources and minimizing adverse impacts where development occurs, the mitigation of potentially adverse environmental consequences is warranted, we must recognize the need for biological connectivity and the overall ecological viability of restoration efforts at a landscape scale, such as has already occurred along portions of the San Pedro River. The conservation and restoration of these rare ecosystem services help avoid carbon emissions, address impacts associated with climate change and help natural resources adapt to these impacts.

The term "ecosystem services market" describes a system in which providers of ecosystem services can access financing to protect, restore and maintain ecological values. Emerging ecosystem services markets can help landowners diversify their incomes, improve the ecological functions of their lands and pass along their lands and the lands' associated benefits to future generations. Maintaining sustainable rural and urban landscapes is important for the quality of life of all Arizonans. Sustainable forestry, agriculture and ranching practices can help to maintain and restore the vitality of Arizona's communities while facilitating the preservation of our culture, natural landscapes and ecosystems. We must focus on the protection of the land, water, air, soil and native flora and fauna upon which our human health and safety depend.

Our natural resources provide food and shelter, flood control, water filtration, clean air, fish and wildlife habitat, recreational opportunities, aesthetic benefits, jobs, and a higher quality of life for all. Science has demonstrated the importance of these natural resources to our daily lives. The adverse impacts of climate change may stress some natural resources and systems to the point that they may struggle to adapt and provide ecosystem services. It is therefore necessary to conserve, enhance, restore, manage and support the maintenance of ecosystem values and services to improve the overall health of our natural resources and maintain these resources for the health, welfare, and enjoyment of present and future generations.

The San Pedro River: An EPA-designated Aquatic Resource of National Importance

In a letter to the ACE dated June 14, 2004, the EPA states:

> Based on our review of the available information, we have determined the proposed project is a candidate for evaluation pursuant to the 1992 Memorandum of Agreement between the Environmental Protection Agency (EPA) and the Department of the Army per CWS Section 404(q). **We respectfully object to the issuance of a permit for the proposed project because the authorization may result in substantial and unacceptable impacts to aquatic resources of national importance (ARNIs).**

In another letter to the ACE dated July 1, 2004, the EPA details the status of the San Pedro River as an Aquatic Resource of National Importance, stating:

> **We respectfully reaffirm our objections to the proposed project and request permit denial on the basis that authorization will have a substantial and unacceptable impact on ARNIs.**

In their detailed comments dated May 25, 2006 the EPA states:

> **The San Pedro River is unquestionably an aquatic resource of international ecological importance and is considered one of the most significant perennial undammed desert rivers in the United States. The ecosystem of the river supports 400 species of migratory birds (more than half of the U.S. total), 40 species of reptiles and amphibians, and 80 species of mammals (including the jaguar), and provides a unique refuge for many federally listed threatened and endangered species.** In recognition of the San Pedro River's significance, Congress established the San Pedro Riparian National Conservation Area (NCA) in 1988, the first of its kind in the nation . . .
>
> The permit area for Whetstone Ranch is an 8,200-acre (12.5 square mile) subdivision of the approximately 15,500-acre Whetstone Ranch project. **Whetstone Ranch represents one of the largest residential subdivisions proposed to the Corps in the state of Arizona, and is the largest proposed to date in this vital and sensitive watershed . . .**
>
> The Whetstone Ranch project, as it is currently described in the Public Notice, will both cause and contribute to the significant degradation and/or elimination of much of the functions and acreage of this portion of the San Pedro River watershed. **The range and severity of environmental consequences resulting from the Whetstone Ranch project are substantial and unacceptable and are contrary to the goals of the Clean Water Act** (emphasis added).

Despite the EPA's strong and clear objections, the ACE issued the Section 404 permit in 2006 without resolving the issues identified by the EPA. Nor was consultation with the FWS initiated, as recommended by the EPA, prior to issuance of the permit. ACE did not adequately consider and address significant new information and objections from the EPA in reaching its original public interest decision.

As noted above, as early as 2004, the EPA officially objected to the ACE's issuance of the 404 permit for Whetstone Ranch, ". . . because the authorization may result in substantial and unacceptable impacts to aquatic resources of national importance." And as late as May 25, 2006, the EPA still objected to the issuance of the 404 permit based upon a lack of compliance with various CWA regulations:

> The attached comments detail our concerns regarding the Corps' issuance of a permit for the proposed project based on: (1) the lack of an adequate analysis of alternatives to demonstrate the maximum practicable level of avoidance and minimization of adverse impacts to waters of the U.S. (waters) as required by CWA Section 404(b)(1); (2) the lack of an adequate compensatory mitigation plan to replace the functions and values of waters lost to unavoidable impacts; and (3) the limiting of the Corps' NEPA "scope of analysis" through an unrealistic, impracticable "no federal action" alternative which fails to meet the project purpose. Pursuant to 40 CFR 230.12(a)(3)iv), the 404(b)(1) Guidelines and NEPA, we recommend the Corps reconsider its findings, require meaningful compliance from the applicant, or deny the permit.

The objections clearly stated by the EPA to the ACE in this correspondence were never resolved prior to the ACE issuance of the Whetstone Ranch 404 permit the following month, June, 2006. It is clear that the EPA's objections and concerns were not adequately considered by the ACE and should be resolved through the re-evaluation of the 404 permit, a public process that incorporates a new NEPA analysis, and further consultation with the EPA and FWS.

Endangered Species, Critical Habitats and Species of Greatest Conservation Need

Any development project with a federal nexus is required to comply with the ESA. The issuance of a 404 permit authorizing impacts to waters of the U.S. constitutes a federal action, and should have already triggered a request for consultation with the FWS under Section 7 of the ESA. However, the FWS has not yet, to the best of our knowledge, been formally consulted by Whetstone Ranch, El Dorado, or the ACE regarding the potential impacts of the development to threatened and endangered species and migratory birds. Therefore, formal consultation with the FWS should be initiated now.

According to the FWS:

> The Endangered Species Act (ESA) directs all Federal agencies to work to conserve endangered and threatened species and to use their authorities to further the purposes of the Act. Section 7 of the Act, called "Interagency Cooperation," is the mechanism by which Federal agencies ensure the actions they take, including those they fund or authorize, do not jeopardize the existence of any listed species.[4]

The ESA states:

[4] Available online at: http://www.fws.gov/Midwest/endangered/section7/section7.html

> Federal agenc[ies] shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded, or carried out by such agency . . . **is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined...to be critical** . . . In fulfilling the requirements of this paragraph each agency shall use the best scientific and commercial data available (ESA Section 7(a)(2)) (emphasis added).

The ACE has, thus far, failed to initiate consultation with the FWS regarding potential and foreseeable impacts to threatened and endangered species and their habitat from its authorization of the Whetstone Ranch 404 permit and could appear to be in violation of ESA Section 7.

The following provides information on threatened and endangered species, as well as their respective designated and proposed critical habitats, which may be negatively impacted by Vigneto.

Jaguar (*Panthera onca*)

Status: Endangered

The jaguar has been protected in the U.S. as endangered since 1972 (37 FR 6476), in accordance with the Endangered Species Conservation Act of 1969, a precursor to the Endangered Species Act of 1973, as amended (Act; 16 U.S.C. 1531 et seq.). In 2014, the FWS finalized the designation of critical habitat for the endangered jaguar.

The Whetstone Critical Habitat Subunit 4a overlaps with Vigneto's western boundary by approximately 650 acres. In the fall of 2011, a hunter photographed a male jaguar in the Whetstone Mountains. The Federal Register Notice designating jaguar critical habitat notes, "We consider the Whetstone Subunit 4a occupied at the time of listing (37 FR 6476; March 30, 1972) (see "Occupied Area at the Time of Listing" section, above), and, based on photographs taken in 2011, it may be currently occupied . . . Activities that may require special management may include, for example, habitat clearing, the construction of facilities, expansion of linear projects that may fragment jaguar habitat . . ." (Federal Register Vol. 79, No. 43 / Wednesday, March 5, 2014). The Villages at Vigneto Preliminary Community Master Plan intends to build a portion of a resort, mixed use developments, residential housing, an urban vineyard, and linear road and utility infrastructure within designated critical habitat for the jaguar (see Vigneto Preliminary CMP, Land Use Illustration, page 17). Therefore, impacts to the endangered jaguar and its designated critical habitat from habitat clearing, fragmentation, and human disturbance (including

increased recreation, noise, olfactory and light pollution) associated with Vigneto should be thoroughly analyzed and adequately mitigated. This analysis should consider potential impacts to dispersal linkages and habitat connectivity for the jaguar. For example, Vigneto is located such that it will further fragment Wildlife Linkage 97 between the Whetstone Mountains and the San Pedro River corridor identified by the 2006 Arizona Department of Transportation (ADOT) and Arizona Game and Fish Department's (AzGFD) Arizona Wildlife Linkages Assessment. http://azdot.gov/business/environmental-planning/programs/wildlife-linkages

Ocelot (*Leopardus pardalis sonoriensis*)

Status: Endangered

The ocelot has been protected in the U.S. as endangered under the ESA since 1982. Critical habitat has not yet been designated for the ocelot. Vigneto is located within the Arizona/Sonora Management Unit identified in the Ocelot Recovery Plan Draft First Revision. One of the actions identified in this revised recovery plan is to "Reduce the effects of human population growth and development on the ocelot." In 2009, the science-based Sky Island Alliance documented an ocelot in the Whetstone Mountains with a remote camera. Since that time, ocelot have also been confirmed in the adjacent Huachuca and Santa Rita Mountains by the AzGFD, the FWS and University of Arizona researchers.[5] Therefore, impacts to the endangered ocelot from habitat clearing, fragmentation, and human disturbance (including increased recreation, noise, olfactory and light pollution) associated with Vigneto should be thoroughly analyzed and adequately mitigated. This analysis should consider potential impacts to dispersal linkages and habitat connectivity for the ocelot. For example, Vigneto is located such that it will further fragment Wildlife Linkage 97 between the Whetstone Mountains and the San Pedro River corridor.

Mexican Spotted Owl (*Strix occidentalis lucida*)

Status: Threatened

The Mexican Spotted Owl (MSO) has been protected in the U.S. as threatened under the ESA since 1993 (58 FR 14248). In 2004, the FWS finalized the designation of critical habitat for the MSO (Federal Register Vol. 69, No. 168 / Tuesday, August 31, 2004). The western planning boundary for Vigneto is located approximately 0.5 miles east of the MSO's BPW-16 critical habitat unit in the Whetstone Mountains Area. Therefore, impacts to the MSO habitat from human

[5] FWS Service News Release "**Jaguar and Ocelot Recently Photographed by Monitoring Cameras in Southern Arizona":** http://www.fws.gov/news/ShowNews.cfm?ID=2D943A8C-A02D-72C3-AD0026FC04DA0752

disturbance associated with Vigneto, especially increased recreation, noise, olfactory and light pollution, should be thoroughly analyzed and adequately mitigated.

The Mexican Spotted Owl Recovery Plan 2012 states:

> Nationally, 80% of all developed land is at exurban densities (Wade and Theobald 2010), and exurban development is increasing at a greater rate in forested lands of the western U.S. than any other form of development, or in other regions of the country (Brown et al. 2005, Theobald and Romme 2007). This rapid growth away from urban areas, termed "rural sprawl," appears to be due to the attractions of the environmental and recreational amenities of these areas, retirement of "baby boomers," and the increasing separation of home and work locations due to better communications networks (Hansen et al. 2002, Brown et al. 2005, Radeloff et al. 2010). Much of this exurban development is occurring in proximity to NFS and other Federal lands. Housing development within 1 km (0.6 mi) of National Forests increased by an average of 20.8% per decade from 1940-2000 and has been above the national average for housing growth since the 1970s (Radeloff et al. 2010). **This pattern of greater-than-average development near and within Federal lands is expected to continue within the range of the owl, with a greater than 25% increase projected for the states of Arizona, Colorado, New Mexico, and Utah from 2000 to 2030 (Wade and Theobald 2010).**
>
> **Exurban development is a potential threat in all Mexican Spotted Owl EMUs in the U.S.** . . . Land development adjacent to non-developed areas can influence species distribution and abundance, as well as ecological function, within those areas by a number of mechanisms, most notably by reduction in effective size of the area, alteration of ecological processes (e.g. predation, competitive interactions), loss of important habitat features or seasonally important use areas for the species, and disturbance (Hansen and DeFries 2007). Habitat loss and fragmentation due to development usually impacts species on a landscape-scale, but development also has local-scale impacts, particularly due to disturbance and vegetation change (Schlesinger et al. 2008). No studies have evaluated the influence of land development on use of habitat by spotted owls or effects on habitat quality. **Although most known owls occur on Federal lands, specific developments in Arizona and New Mexico have been suspected to impact spotted owl habitat. In addition, the extent to which these owls forage or winter on lands subject to development is unknown, but it is likely that the development of private lands within and surrounding Federal lands directly affects habitat used by spotted owls[6].**

[6] Mexican Spotted Owl Recovery Plan, First Revision, December 2012, pages 45-46
http://www.fws.gov/southwest/es/Documents/R2ES/Mexican_Spotted_Owl_Recovery_Plan_2012_Module_1.pdf

Western Yellow-billed Cuckoo (*Coccyzus americanus*)

Status: Threatened

The Western Yellow-billed Cuckoo (WYBC) has been protected in the U.S. as threatened under the ESA since 2014. In 2015, the FWS proposed critical habitat for the WYBC. This designation has not yet been finalized. However, the proposed designation includes critical habitat unit AZ-18 Upper San Pedro River unit astride the San Pedro River, which is located downstream of Vigneto. The Federal Register Notice description of Unit AZ-18 states "This unit has one of the largest remaining breeding groups of the western yellow-billed cuckoo and is consistently occupied by a large number of pairs. The site also provides a movement corridor for Western yellow-billed cuckoos moving farther north." The eastern boundary of Vigneto's planning area is located approximately 1.5-3.0 miles from the AZ-18 critical habitat unit. While the footprint of Vigneto's development does not overlap with the WYBC critical habitat boundaries, there is the potential for indirect, secondary and cumulative impacts to habitat downstream. Of particular concern is the possibility that Vigneto's significant projected increase in ground water pumping could create a cone of depression that would contribute to ground water depletion and could ultimately reduce surface water flows in the San Pedro River. Any reduction in surface water flows in the San Pedro could have serious detrimental effects to the riparian habitat that supports the maintenance of critical habitat for the cuckoo.

Furthermore, there is also a possibility that potential cuckoo habitat could be directly adversely impacted by Vigneto's proposed development in Madrean oak woodland habitat located in the western portion of Vigneto's planning area in the foothills of the Whetstone Mountains. Tucson Audubon has previously documented and reported to the FWS use of this habitat type by nesting cuckoos and submit that this habitat type is essential for the WYBC in Arizona http://tucsonaudubon.org/cuckoo Therefore, the FWS should be consulted to thoroughly analyze and identify adequate mitigation measures for Vigneto's direct, indirect, secondary and cumulative impacts upon the Western Yellow-billed Cuckoo and its proposed critical habitat.

From our exploration of the best scientific data available in southeast Arizona and northern Sonora, Mexico, the WYBC appears to have a much wider ecological niche than the dated, most often cited research conducted in other portions of the WYBC's range would suggest. In this region, vegetation composition and structure appear to be important drivers of habitat selection. WYBC have been documented in southeast Arizona and northern Sonora utilizing a diversity of sky island vegetation communities. For example, in northern Sonora between 2001-

2006, of 87 sites where WYBC were detected, 45% were in Sinaloan Thornscrub, 30% were in the Arizona Upland Subdivision of the Sonoran Desert, 21% were in Semidesert Grasslands, 3% were in Madrean Evergreen Woodland, and 1% were in Plains Grasslands (Tropical Deciduous Forests were not among the habitat types surveyed).

Between May and July of 2010, a survey of birds and habitat conducted in ten sky island mountain ranges in northern Sonora, Mexico also documented WYBC in the Cucurpe and El Tigre sky island mountain ranges at elevations ranging from 3,774 to 6,903 feet, and according to the survey report were "presumed breeding" (Flesch *et al*. 2010). Many of the WYBC observations by Flesch *et al*. were located outside of the more typical deciduous broadleaf riparian woodlands in a variety of habitats, including areas of mesquite and acacia scrub, in desert scrub and semidesert grasslands, and areas dominated by montane shrubs and dense, low deciduous growth in Madrean evergreen woodlands and even montane conifer forest with a shrub component. This research demonstrates that WYBC utilize a variety of microphyllous woodlands and scrub habitats that have not yet been described in the literature (Dr. Aaron Flesch, personal comm. 2/10/15, 2/11/15 and 2/20/15). Therefore, it should not be assumed that the only impact to WYBC from Vigneto would occur downstream along the San Pedro River, although this is a major concern. We recommend that surveys for Western Yellow-billed Cuckoo be conducted in these diverse sky island vegetation communities located within and adjacent to the Vigneto planning area.

Southwestern Willow Flycatcher (Empidonax traillii extimus)

Status: Endangered

The Southwestern Willow Flycatcher (SWWF) has been protected in the U.S. as endangered under the ESA since 1995. In 2013, the FWS designated critical habitat for the SWWF.

The SWWF Recovery Plan (2002) states:

> Diversions and Groundwater Pumping: Surface water diversions and groundwater pumping for agricultural, industrial, and municipal uses are major factors in the deterioration of southwestern willow flycatcher habitats (Briggs 1996) (Appendix D Table 2). The principal effect of these activities is simple reduction of water in riparian ecosystems and associated subsurface water tables. Examples: (1) Of the Colorado River's approximate flow of 16 million acre-feet (maf) per year, human consumptive use

> accounts for almost 11 maf and reservoirs evaporate 1.5 maf, leaving little for riparian and aquatic ecosystems. Agriculture uses over twothirds of the water dverted or pumped from the lower Colorado River basin, with at least 40% of this share used to grow livestock feed (Morrison et al. 1996); (2) Pacific River Institute's report on Colorado River Water, including statistics on magnitude of groundwater overdraft in AZ, NV, and CA, population and water consumption projections, and proportion of water used by agriculture; (3) CEC report's conclusion about the impacts of groundwater overdraft on the San Pedro Riparian National Conservation area; (4) Explanation of Arizona Department of Environmental Quality's declaration of groundwater mining in the Prescott Active Management Area and the potential ramifications on the Verde River. Chemistry, especially salinity, of water and soils may also be significantly affected by these activities (see Appendix I).[7]

Numerous SWWF critical habitat units are located downstream from Vigneto ("Middle and Lower San Pedro Complex"), Therefore, potential impacts from Vigneto's groundwater pumping to surface water flow that supportscritical habitat for the SWWF downstream from Vigneto on the San Pedro River should be evaluated and adequately mitigated

Huachuca Water Umbel (*Lilaeopsis schaffneriana var. recurva*)

Status: Endangered

The Huachuca Water Umbel has been protected in the U.S. as endangered under the ESA since 1997. In 1999, the FWS designatedcritical habitat for the Huachuca Water Umbel. One of the critical habitat units is located along the San Pedro River (Complex 7) approximately 5.75 miles southeast from Vigneto and could be negatively impacted by Vigneto's planned development and groundwater pumping.

According to the FWS,

> **Continuing loss of aquatic habitat due to surface and groundwater withdrawal is a threat. The small habitat areas that remain are at risk from increased magnitude of runoff from degraded watersheds that can erode habitats and displace plants, or fill in the shallow**

[7] Final Recovery Plan for Southwest Willow Flycatcher (August, 2002), pages 34-35, available online at: http://www.fws.gov/carlsbad/SpeciesStatusList/RP/20020830_RP_SWWF.pdf

waters with excess sediment. Expansion of non-native plant species that increase vegetation density in habitat also degrades habitat quality needed for population growth.[8]

Therefore, potential impacts from Vigneto's groundwater pumping to surface water flow that supports critical habitat for the Huachuca Water Umbel upstream or downstream on the San Pedro River should be evaluated and adequately mitigated.

Migratory Bird Treaty Act of 1918

The FWS website states:

> The original 1918 statute implemented the 1916 Convention between the U.S. and Great Britain (for Canada) for the protection of migratory birds. Later amendments implemented treaties between the U.S. and Mexico, the U.S. and Japan, and the U.S. and the Soviet Union (now Russia).
>
> Specific provisions in the statute include:
>
> Establishment of a Federal prohibition, unless permitted by regulations, to "pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, included in the terms of this Convention . . . for the protection of migratory birds . . . or any part, nest, or egg of any such bird." (16 US.C. 703)
>
> This prohibition applies to birds included in the respective international conventions between the U.S. and Great Britain, the U.S. and Mexico, the U.S. and Japan, and the U.S. and the Russia.
>
> Authority for the Secretary of the Interior to determine, periodically, when, consistent with the Conventions, "hunting, taking, capture, killing, possession, sale, purchase, shipment, transportation, carriage, or export of any . . .bird, or any part, nest or egg" could be undertaken and to adopt regulations for this purpose. These determinations are to be made based on "due regard to the zones of temperature and to the distribution, abundance, economic value, breeding habits, and times of migratory flight." (16 U.S.C. 704[9])

In its May 25, 2006 letter to the ACE, EPA states: "The ecosystem of the river supports 400 species of migratory birds (more than half of the U.S. total) . ." Given that the San Pedro River

[8] FWS Environmental Online Conservation System, Species Profile for the Huachuca Water Umbel, available online at: http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=Q2PK

[9] FWS Website: https://www.fws.gov/laws/lawsdigest/migtrea.html

Valley is a well-documented, continentally-significant bird migration corridor, the FWS should be consulted regarding potential impacts to migratory birds protected under the Migratory Bird Treaty Act from the Vigneto development, including the possibility that groundwater pumping could lead to the loss and degradation of habitats and resources that support long-distance bird migrations.

Habitat Destruction, Modification, Degradation and Fragmentation

In a 2004 letter from the EPA to the ACE dated June 14, 2004 regarding the pending Section 404 permit for Whetstone Ranch, the EPA states:

> The project site is a relatively undisturbed desert grassland environment, characterized by a dense network of 475 acres of braided ephemeral streams directly tributary to the San Pedro River. The proposed project would eliminate 51 acres of these waters via direct discharges of fill material, a significant amount of jurisdictional waters. Spread broadly across the site in over 350 locations, **the proposed 51 acres of discharges would severely fragment the remaining "avoided" waters and degrade ecosystem processes and functions. In addition to surface hydrological and biological functions, the project is likely to affect groundwater resources at the San Pedro River already exhibiting declining water levels due to groundwater pumping. The increase in groundwater pumping required to serve Whetstone Ranch, combined with the removal of 51 acres of tributary waters, may exacerbate this degradation.** The project will also substantially reduce capacity of aquatic and terrestrial organisms to enter and leave riverine waters of the U.S. through large, continuous patches of intact habitat. The proposed project site is presently composed of, and surrounded for several miles by, a functioning desert mosaic of native plant communities. **Development of this site will disrupt food webs and destroy migration networks which, on the landscape scale, are difficult or impossible to mitigate** (emphasis added).

According to the USGS Southwest ReGAP land classification, the Vigneto planning area currently supports a mosaic of intact vegetation communities, including Apacherian-Chihuahuan Mesquite Upland Shrub, Apacherian-Chihuahuan Desert Grassland Steppe, Chihuahuan Creosotebush, Mixed Desert and Thorn Scrub, and patches of Madrean Encinal, Madrean Pinyon-Juniper Woodland and Mogollon Chaparral and in the western portion of the property in the foothills of the Whetstone Mountains.

These vegetation communities provide habitat for a diversity of wildlife species, including a long list of Species of Greatest Conservation Need, as identified by the AzGFD and catalogued in the Heritage Data Management System (HDMS) (see Tables 1 and 2).

Table 1. Species of Greatest Conservation Need in the Vigneto Planning Area

Taxa	Common	Scientific	Tier
Amphibian	Chiricahua Leopard Frog	Rana chiricahuensis	1a
Amphibian	Sonoran Desert Toad	Bufo alvarius	1b
Bird	American Peregrine Falcon	Falco peregrinus anatum	1a
Bird	Arizona Bell's Vireo	Vireo bellii arizonae	1b
Bird	Arizona Botteri's Sparrow	Peucaea botterii arizonae	1b
Bird	Arizona Grasshopper Sparrow	Ammodramus savannarum ammolegus	1b
Bird	Blue-throated Hummingbird	Lampornis clemenciae	1b
Bird	Broad-billed Hummingbird	Cynanthus latirostris	1b
Bird	Common Nighthawk	Chordeiles minor	1b
Bird	Ferruginous Hawk	Buteo regalis	1b
Bird	Gila Woodpecker	Melanerpes uropygialis	1b
Bird	Gilded Flicker	Colaptes chrysoides	1b
Bird	Golden Eagle	Aquila chrysaetos	1b
Bird	Gould's Turkey	Meleagris gallopavo mexicana	1b
Bird	Lincoln's Sparrow	Melospiza lincolnii	1b
Bird	Mexican Spotted Owl	Strix occidentalis lucida	1a
Bird	Mountain Pygmy-Owl	Glaucidium gnoma gnoma	1b
Bird	Rufous-winged Sparrow	Peucaea carpalis	1b
Bird	Savannah Sparrow	Passerculus sandwichensis	1b
Bird	Sprague's Pipit	Anthus spragueii	1a
Bird	Violet-crowned Hummingbird	Amazilia violiceps	1b
Bird	Western Grasshopper Sparrow	Ammodramus savannarum perpallidus	1b
Bird	Yellow Warbler	Dendroica petechia	1b
Mammal	Antelope Jackrabbit	Lepus alleni	1b
Mammal	Arizona Myotis	Myotis occultus	1b
Mammal	Banner-tailed Kangaroo Rat	Dipodomys spectabilis	1b
Mammal	Black-tailed Prairie Dog	Cynomys ludovicianus	1a
Mammal	Cave Myotis	Myotis velifer	1b
Mammal	Cockrum's Desert Shrew	Notiosorex cockrumi	1b
Mammal	Coues whitetail deer	Odocoileus virginianus couesi	1b
Mammal	Greater Western Mastiff Bat	Eumops perotis californicus	1b
Mammal	Harris' Antelope Squirrel	Ammospermophilus harrisii	1b
Mammal	Jaguar	Panthera onca	1a
Mammal	Kit Fox	Vulpes macrotis	1b
Mammal	Lesser Long-nosed Bat	Leptonycteris yerbabuenae	1a
Mammal	Mexican Free-tailed Bat	Tadarida brasiliensis	1b
Mammal	Ocelot	Leopardus pardalis	1a
Mammal	Pale Townsend's Big-eared Bat	Corynorhinus townsendii pallescens	1b

Mammal	Pocketed Free-tailed Bat	Nyctinomops femorosaccus	1b
Mammal	Southern Pocket Gopher	Thomomys umbrinus intermedius	1b
Mammal	Spotted Bat	Euderma maculatum	1b
Mammal	Western Red Bat	Lasiurus blossevillii	1b
Mammal	Western Yellow Bat	Lasiurus xanthinus	1b
Mammal	Yuma Myotis	Myotis yumanensis	1b
Reptile	Gila Monster	Heloderma suspectum	1a
Reptile	Hooded Nightsnake	Hypsiglena species novum	1b
Reptile	Ornate Box Turtle	Terrapene ornata	1a
Reptile	Regal Horned Lizard	Phrynosoma solare	1b
Reptile	Rock Rattlesnake	Crotalus lepidus	1a
Reptile	Sonoran Coralsnake	Micruroides euryxanthus	1b
Reptile	Sonoran Whipsnake	Masticophis bilineatus	1b
Reptile	Tiger Rattlesnake	Crotalus tigris	1b

Data Source: AzGFD HabiMap™ Queries from the Arizona Statewide Wildlife Action Plan, Grid #s 31256, 31257, 31375, 31376
Tier 1a: Scored "1" for Vulnerability in at least one of the eight categories and matches at least one of the following: Federally listed as endangered or threatened under the ESA; Candidate species under ESA; Is specifically covered under a signed conservation agreement (CCA) or a signed conservation agreement with assurances (CCAA); Recently removed from ESA and currently requires post-delisting monitoring; Closed season species (i.e., no take permitted) as identified in Arizona Game and Fish Commission Orders 40, 41, 42 or 43.
Tier 1b: Scored "1" for Vulnerability in at least one of the eight categories, but match none of the above criteria.

Using HabiMap, we conducted queries for known sensitive species occurrences in the Vigneto Planning Area, including both the Benson and McGrew Spring Quadrangles (Tables 2 & 3).

Table 2: HDMS Query, Benson Quadrangle

Scientific Name	Common Name	USESA	USFS	BLM	STATE	GRANK	SRANK
Anaxyrus debilis insidior	Western Green Toad					G5T5	S3
Antrozous pallidus	Pallid Bat					G5	S4
Bat Colony						GNR	SU
Echinomastus erectocentrus var. erectocentrus	Needle-spined Pineapple Cactus	SC			SR	G3T3Q	S3
Eriogonum terrenatum	San Pedro River Wild Buckwheat			S		G1	S1S2
Heliomeris hispida	Hairy Goldeneye					G3G4	S1
Lasiurus blossevillii	Western Red Bat		S			G5	S3
Mammillaria heyderi var. bullingtoniana	Cream Cactus				SR	G4?T2T4	S1S2
Mammillaria wrightii var. wilcoxii	Wilcox Fishhook Cactus				SR	G4T4	S4
Phrynosoma cornutum	Texas Horned Lizard	SC				G4G5	S3S4
Psorothamnus scoparius	Broom Dalea					G4	S1
Reithrodontomys montanus	Plains Harvest Mouse					G5	S3
Rena dissectus	New Mexico Threadsnake					G4G5	S3
Tadarida brasiliensis	Brazilian Free-tailed Bat					G5	S3S4

Note: This query was generated using the AzGFD's HabiMap™. The query creates a sensitive species list generated from the HDMS based on known occurrences. The results are at a quad level scale. For more information on HDMS and special status species please use http://www.azgfd.gov/hdms.

Table 3: HDMS Query, McGrew Spring Quadrangle

Scientific Name	Common Name	USESA	USFS	BLM	STATE	GRANK	SRANK
Aspidoscelis stictogramma	Giant Spotted Whiptail	SC	S			G4	S2
Bat Colony						GNR	SU
Bat Foraging Area	High Netting Concentration					GNR	SU
Choeronycteris mexicana	Mexican Long-tongued Bat	SC	S	S		G4	S3
Eriogonum terrenatum	San Pedro River Wild Buckwheat			S		G1	S1S2
Leopardus pardalis	Ocelot	LE				G4	S1
Leptonycteris curasoae yerbabuenae	Lesser Long-nosed Bat	LE				G4	S2S3
Mammillaria heyderi var. bullingtoniana	Cream Cactus				SR	G4?T2T4	S1S2
Mammillaria wrightii var. wilcoxii	Wilcox Fishhook Cactus				SR	G4T4	S4
Myotis californicus	California Myotis					G5	S4
Myotis velifer	Cave Myotis	SC		S		G5	S3S4
Phrynosoma cornutum	Texas Horned Lizard	SC				G4G5	S3S4
Phrynosoma hernandesi	Greater Short-horned Lizard					G5	S4
Scutellaria potosina var. tessellata	Huachuca Mountains Skullcap					G2G4	S2
Sonorella walkeri	Santa Rita Talussnail					G5	S2
Sophora arizonica	Arizona Necklace					G3	S3
Tadarida brasiliensis	Brazilian Free-tailed Bat					G5	S3S4

Note: This query was generated using the AzGFD's HabiMap. The query creates a sensitive species list generated from the HDMS based on known occurrences. The results are at a quad level scale. For more information on HDMS and special status species please use http://www.azgfd.gov/hdms.

Wildlife Dispersal Linkages and Habitat Connectivity

Wildlife dispersal linkages and habitat connectivity were not adequately considered in the analysis for the 2006 Whetstone Ranch Section 404 permit, nor has the expanded Villages at Vigneto been assessed for its (potentially greater) impacts to habitat connectivity on a landscape scale.

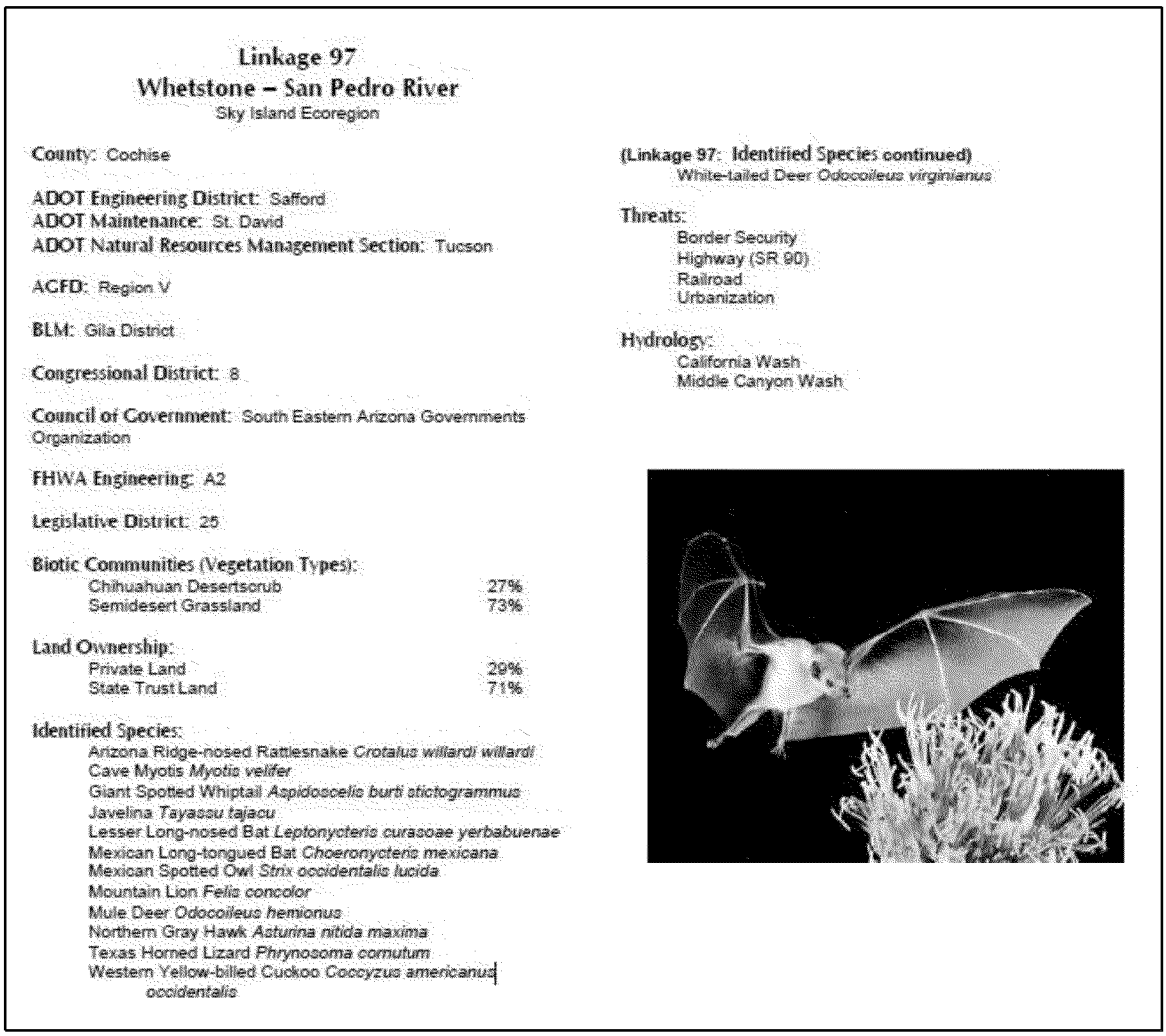
The southern half of Vigneto is located in Arizona Wildlife Linkage Zone 97, which was identified in the ADOT and AzGFD's 2006 Arizona Wildlife Linkages Assessment. See Figures 4 & 5.

The development and increased traffic and disturbance from Vigneto would fragment and impair the northernmost-third of this wildlife linkage. In addition to the species identified for this linkage in the 2006 Assessment, both the endangered jaguar and ocelot are additional wide ranging species documented using the landscape in this region that should also be carefully considered.

In a letter from the EPA to the ACE dated July 1, 2004 regarding the proposed Whetstone Ranch development, the EPA reiterated its concern regarding the habitat fragmentation and the degradation of ecosystem processes Whetstone Ranch would cause:

The project, as currently proposed, will substantially reduce the capacity of aquatic and terrestrial organisms to enter and leave the riverine waters of the U.S. through large, contiguous patches of intact habitat. The proposed project site is presently composed of, and surrounded by, a functioning desert mosaic of native plant communities. The proposed project will disrupt food webs and destroy migration networks which, on the landscape scale, are difficult or impossible to mitigate.

Indeed, urbanization and SR 90 are both identified by the assessment as primary threats to the Arizona Wildlife Linkage Assessment Linkage 97. See Figure 3.



Linkage 97
Whetstone – San Pedro River
Sky Island Ecoregion

County: Cochise

ADOT Engineering District: Safford
ADOT Maintenance: St. David
ADOT Natural Resources Management Section: Tucson

AGFD: Region V

BLM: Gila District

Congressional District: 8

Council of Government: South Eastern Arizona Governments Organization

FHWA Engineering: A2

Legislative District: 25

Biotic Communities (Vegetation Types):

Chihuahuan Desertscrub	27%
Semidesert Grassland	73%

Land Ownership:

Private Land	29%
State Trust Land	71%

Identified Species:
Arizona Ridge-nosed Rattlesnake *Crotalus willardi willardi*
Cave Myotis *Myotis velifer*
Giant Spotted Whiptail *Aspidoscelis burti stictogrammus*
Javelina *Tayassu tajacu*
Lesser Long-nosed Bat *Leptonycteris curasoae yerbabuenae*
Mexican Long-tongued Bat *Choeronycteris mexicana*
Mexican Spotted Owl *Strix occidentalis lucida*
Mountain Lion *Felis concolor*
Mule Deer *Odocoileus hemionus*
Northern Gray Hawk *Asturina nitida maxima*
Texas Horned Lizard *Phrynosoma cornutum*
Western Yellow-billed Cuckoo *Coccyzus americanus occidentalis*

(Linkage 97: Identified Species continued)
White-tailed Deer *Odocoileus virginianus*

Threats:
Border Security
Highway (SR 90)
Railroad
Urbanization

Hydrology:
California Wash
Middle Canyon Wash

Figure 3: Arizona Wildlife Linkages Assessment (2006), Linkage Zone 97 Description, Section VII, page 108. Available online at: http://azdot.gov/business/environmental-planning/programs/wildlife-linkage

The ADOT website summary that describes the Arizona Wildlife Linkages Assessment states:

> Biologists, engineers, planners and land managers from nine public agencies have worked together since 2004 to identify large blocks of protected habitat, the potential wildlife movement

corridors through and between them, the factors that could possibly disrupt these linkage zones and opportunities for conservation. Recognizing that habitat connectivity is a landscape issue involving multiple land jurisdictions, this workgroup has engaged in unprecedented cooperation and facilitated discussions and partnerships to help ensure a unified approach to wildlife linkage conservation and management. This reinforces the commitment to and efficiency of wildlife connectivity measures undertaken by all stakeholders, using research and adaptive management in ongoing evaluations of those measures.

The assessment document and map are the initial efforts to identify potential linkage zones that are important to Arizona's wildlife and natural ecosystems. This is only the first step in a continuing process of defining critical habitat connectivity areas. This nonbinding document and map serve as an informational resource to planners and engineers, providing suggestions for the incorporation of these linkage zones into their management planning to address wildlife connectivity at an early stage of the process. If considerations for wildlife connectivity can be integrated into regional planning and projects early in the process, the linkage areas (or some portion of them) have the potential to be maintained or conserved during this time of growth and development.

Tucson Audubon staff and its Conservation Chair were among the biologists and land use planning experts who participated in the assessment's workshops. We encourage the ACE to incorporate this assessment into its re-evaluation of the Section 404 permit, and to conserve and maintain the functionality of Linkage 97 to the greatest degree practicable. Adequate mitigation for unavoidable impacts from habitat loss and fragmentation should be required.

TNC's Natural Infrastructure Assessment

TNC's Natural Infrastructure Website states:

> Arizona's population is projected to double by 2050 and the associated urban footprint may quadruple. An analysis of growth projections and the natural infrastructure reveals that if growth follows current projections, we would lose nearly 2 million acres of natural infrastructure by 2050. This loss of desert, grassland, and forest habitat could adversely impact at least 120 species of concern. Although additional factors would need to be considered in more detailed analyses, such as the effects to groundwater and streams that support riparian habitat, this example illustrates how natural infrastructure data can be integrated into growth planning . . . We created a statewide map and dataset of Arizona's natural infrastructure by integrating 12 statewide and regional information sources. The Nature Conservancy's Arizona's Natural Infrastructure (2008) includes:

- sensitive biological lands and waters: areas supporting core habitat or providing corridors for wildlife as identified by 5 scientific studies

- open space plans: areas with existing or proposed designation for outdoor recreational use as identified by multiple county & municipal governments and community open space plans[10]

The Vigneto planning area overlaps TNC's Arizona Natural Infrastructure Whetstone Mountains Unit by approximately 1,400 acres. According to the March, 2015 Villages at Vigneto Preliminary Community Master Plan (CMP), El Dorado proposes to build a resort, residential and mixed use developments in this ecologically valuable and sensitive area (see Vigneto Preliminary CMP, Land Use Illustration, page 17).

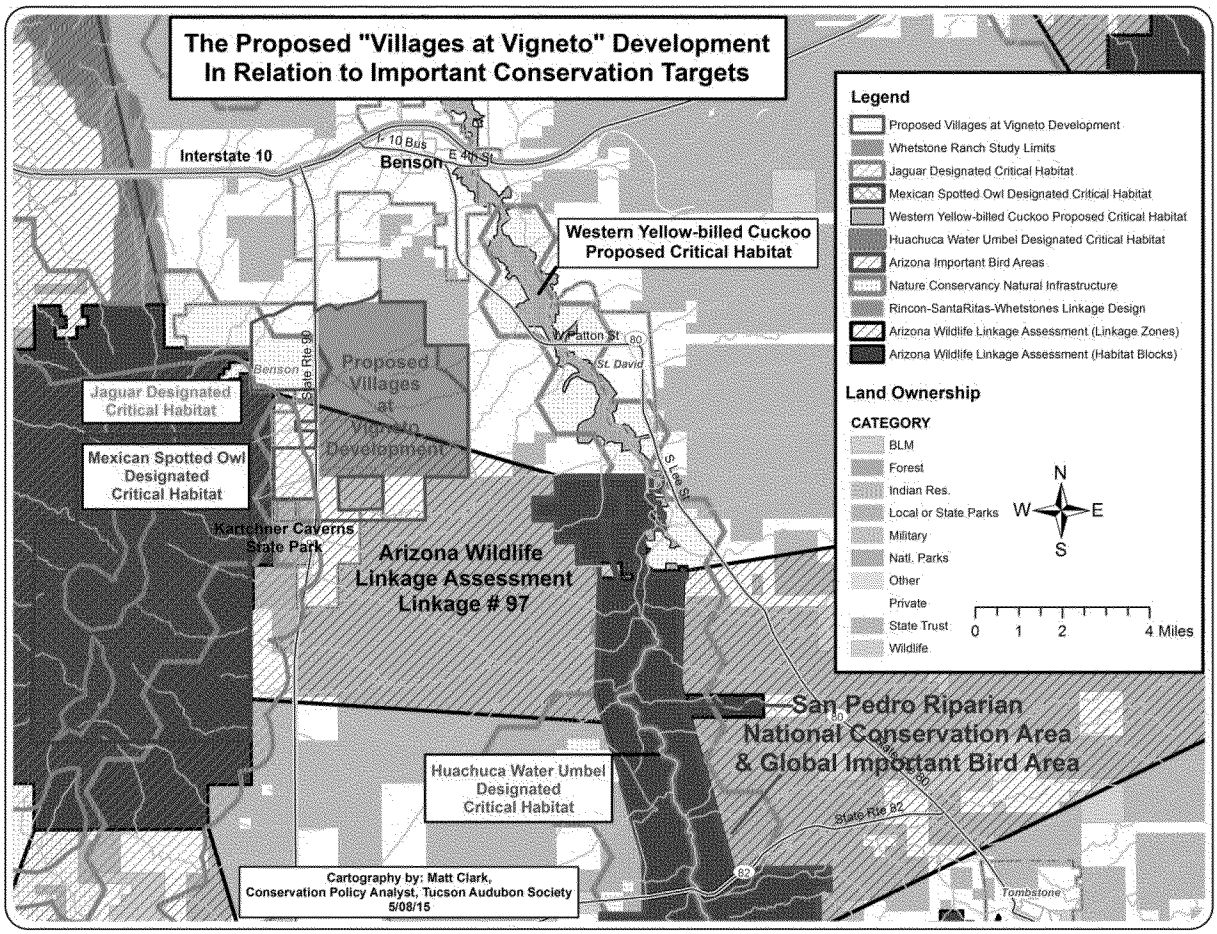


Figure 4: This map illustrates the spatial relationship between the Villages at Vigneto and Important Conservation Targets, including the San Pedro Riparian National Conservation Area and Global Important Bird Area (which includes St David Cienega), designated and proposed critical habitats, TNC's Natural Infrastructure, habitat blocks, wildlife linkages, Coronado National Forest (Whetstone Mountains) and Kartchner Caverns State Park.

[10] TNC's Natural Infrastructure Assessment online at: http://azconservation.org/projects/natural_infrastructure

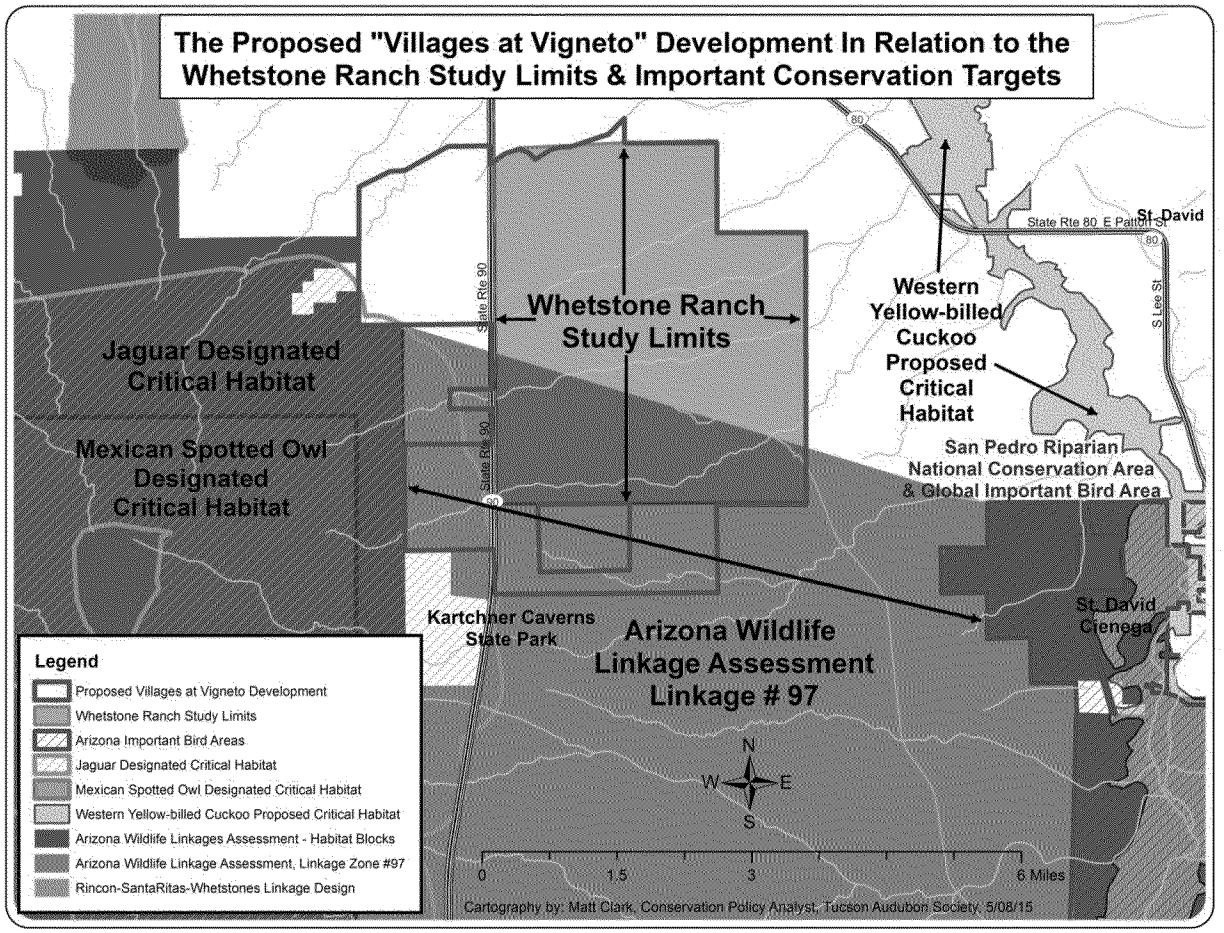


Figure 5: This map illustrates the spatial relationship between the proposed Villages at Vigneto development and the Whetstone Ranch Study Limits (ACE 2006) and Important Conservation Targets.

Potential Hydro-geologic Connection Between Groundwater and Surface Water of the San Pedro River

A May 5, 2015 USGS news release that summarizes Part 2 of the planned 3-part Study of the Middle San Pedro Watershed states:

> Water availability in the middle San Pedro watershed in southeast Arizona is strongly dependent on climate and water use, according to a new water resource assessment by the U.S. Geological Survey, in cooperation with the Arizona Department of Water Resources.
>
> Groundwater is the primary source of water for municipal, domestic, industrial and agricultural use in the middle San Pedro watershed. Demand for water resources is projected to increase to meet the water needs of the growing population in the region. **An improved understanding of**

available water resources and how water moves through the watershed can improve the capability of resource managers to optimally use this important resource and minimize or mitigate the effects of development.

Findings characterize the current state of water resources and reveal how water resources have changed in the past. The new report describes how surface water and groundwater move throughout the system and evaluates water quality and chemistry throughout the watershed. The full report can be accessed online.[11]

"Recognizing the effects of water use in the watershed are likely to be difficult and complex," said lead author of the report and USGS scientist Jeffrey Cordova.

"The information gathered in this report lays a strong foundation for the potential to develop a hydrologic model, which would be useful for simulating the potential effects of groundwater use on the aquifer, streams and surrounding areas."

The study analyzed how the groundwater system changed after the middle San Pedro watershed was developed as a water resource. During predevelopment times, it's assumed that the total average inflow of water into the watershed was balanced by the average total water outflow. **In the Benson subarea for the period after development from 2001–2009, the average total outflow exceeded the average total inflow by an amount of water equivalent to around 3,000 Olympic swimming pools per year (6,000 acre-feet). During predevelopment times, base flow leaving the Benson subarea was equivalent to 2,700 Olympic swimming pools per year (5,500 acre-feet). As of 2009, the base flow leaving both the Benson and Narrows-Redington subareas is now zero as groundwater discharges only in select reaches of the San Pedro River and only for part of the year.**

Climate has also greatly influenced the amount of water available throughout the San Pedro watershed over the past few decades. The study found that groundwater and streamflow responded to periods of higher precipitation in the mid-1980s to mid-1990s, as well as to periods of overall lower precipitation in the 1960s through mid-1980s and mid-1990s to 2009. **The median annual streamflow of the San Pedro River near Tombstone decreased by 50 percent between the periods of 1968–1986 and 1997–2009. The amount of water entering the soil from the San Pedro River, also known as streamflow infiltration, has also decreased 44 percent from 1914–2009 . . .**

[11] Available online at: http://pubs.usgs.gov/sir/2013/5040/

> This is the second USGS report that describes the various aspects of the hydrology of the middle San Pedro watershed. The first report describing the hydro-geologic framework is available online (emphasis added).[12]

The EPA has clearly expressed objections to the Whetstone Ranch Section 404 Permit #2003-00826-SDM based upon Significant Degradation – 40 CFR 230.10(c),

> The regulations prohibit discharges that would cause or contribute to significant degradation of the aquatic ecosystem (40 CFR 230.10(c)(3)). The Whetstone project, as proposed, has the potential to do both.
>
> The proposed project would result in the loss of ephemeral waters important to the San Pedro River ecosystem both individually (the proposed development) and cumulatively (reasonably foreseeable induced development). Existing desert washes would be converted from topographically diverse, vegetated systems into barren channels with flat bottoms. The wildlife functions of the aquatic ecosystems would be significantly degraded or lost altogether via direct alteration of the relatively moist in-stream habitat, and the fragmentation [of] landscapes crucial for wildlife migration, gathering, and dispersal.
>
> **Existing water consumption practices in the basin have reached a point where the draw down of groundwater exceeds the rate of natural recharge. Given the potential for the project to accelerate and exacerbate this problem, it is reasonably foreseeable that the San Pedro River could be ultimately converted from a perennial to an intermittent or ephemeral aquatic system. This increasing degradation would be contrary to the goals of the CWA protecting the physical, chemical and biological integrity of the Nation's waters.**

Both USGS reports on the Middle San Pedro River Watershed (Parts 1 and 2) should be fully considered by the ACE, the EPA and the FWS through their respective regulatory roles and oversight. These USGS reports, though lacking Part 3 (defunded due to ADWR budget cuts) and thus incomplete, currently represent the best available science and data with regard to surface and subsurface hydrology in the Middle San Pedro Watershed, and the roles of climate and water use. We strongly suggest that the completion of Part 3 is essential to better inform the El Dorado 404 permit re-evaluation.

For example, the Part 2 Study by Cordova *et al.* 2015 shows data from wells located in the confined aquifer (the area where Vigneto plans to pump its groundwater) and that water levels

[12] Available online: http://pubs.usgs.gov/sir/2010/5126/

have been steadily decreasing. Water level declines have been consistent, from 5 to 20 meters over a period of 66 years.

Cordova *et al*. 2015 state: "Water level records in four wells completed in the confined part of the coarse lower basin fill generally declined from 1944 to 2010 (fig. 18). Declines in these wells likely are related to reduced pressures in the confined and semi-confined aquifer because of groundwater withdrawals for agriculture and municipal use." (See copy of Figure 18 below).

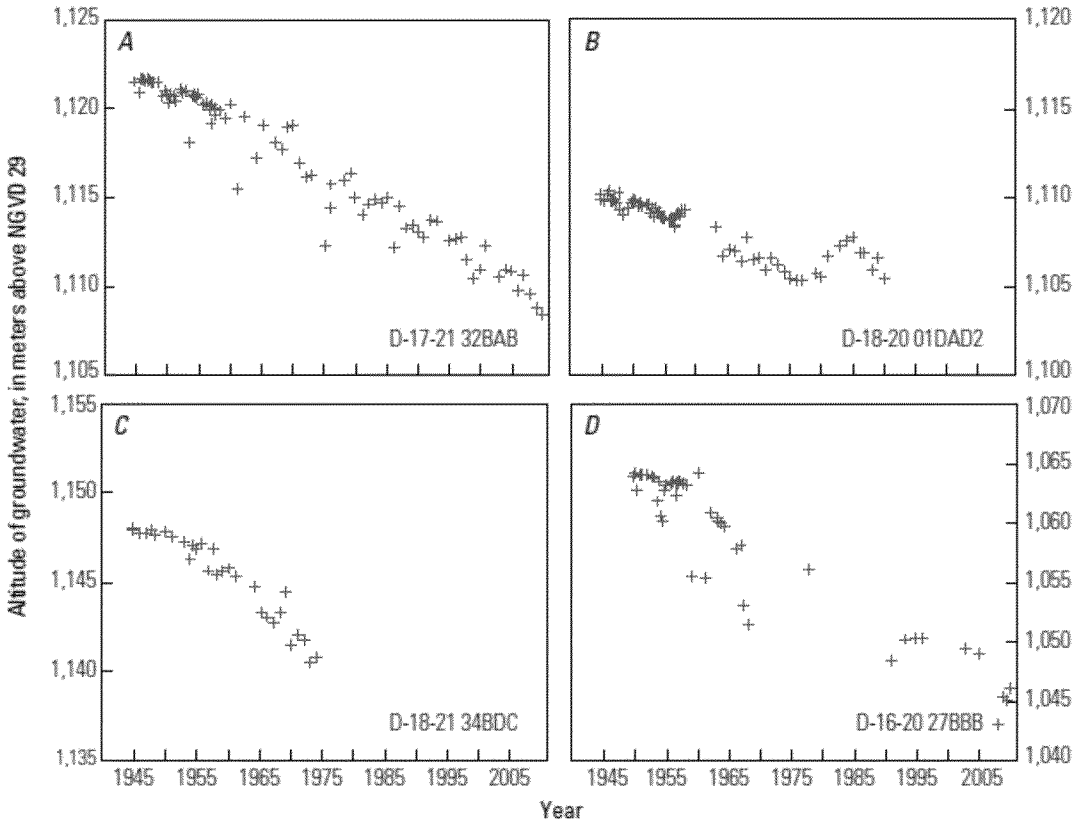


Figure 18. Plots of long-term water-level records in wells perforated in the coarse lower basin fill under confined or semiconfined conditions. Water level is defined as the altitude above sea level (in meters) using the National Geodetic Vertical Datum of 1929 (NGVD 29).

Invasive Species

The threat of invasive, non-native plant and animal species being introduced to the area will be increased with extensive ground disturbance associated with such massive scale development, potentially impacting fire regimes and public health and safety. Significant potential impacts to threatened and endangered species exist with any increase in population of both feral and

domesticated felines and canines and should be considered in any re-evaluation of the 404 permit.

Conclusion

This letter represents a formal request that the ACE re-evaluate the CWA Section 404 permit for Whetstone Ranch to Whetstone Partners LLC/LLP (Permit #2003-00826-SDM) and provide an opportunity for public comment under the National Environmental Policy Act (NEPA). Tucson Audubon is concerned that the analysis in the permit was incomplete at the time, and is now completely outdated due to changed circumstances and significant new information that has become available since the permit was issued in 2006. Furthermore, we are concerned that objections and instructions from the EPA seem not to have been resolved prior to the issuance of the 2006 permit, nor has consultation yet occurred with the FWS to evaluate impacts to ESA-listed species and migratory birds. We hope the information provided herein will aid the ACE in its re-evaluation (or re-initiation of a new 404 permit for the new Villages at Vigneto) and further consultations with the EPA. Finally, because Vigneto is an entirely new project with a larger footprint than that of Whetstone Ranch, the ACE and the EPA should require that a new NEPA analysis and public process be conducted.

We appreciate the opportunity to provide these comments and are available to answer any questions you might have.

Sincerely,

Matt Clark
Conservation Policy Analyst
Tucson Audubon Society

Christina McVie
Conservation Chair
Tucson Audubon Society

Karen Fogas

Executive Director

Tucson Audubon Society

CC:

Jason Brush, Regulatory Chief, Region IX, Environmental Protection Agency
75 Hawthorne Street, San Francisco, CA 94105
Phone: (415) 972-3483
Fax: (415) 947-3553

Scott Richardson, Supervisory Fish & Wildlife Biologist, U.S. Fish and Wildlife Service
201 North Bonita, Suite 141, Tucson, AZ 85745
Phone: (520) 670-6144
Fax: (520) 670-6155